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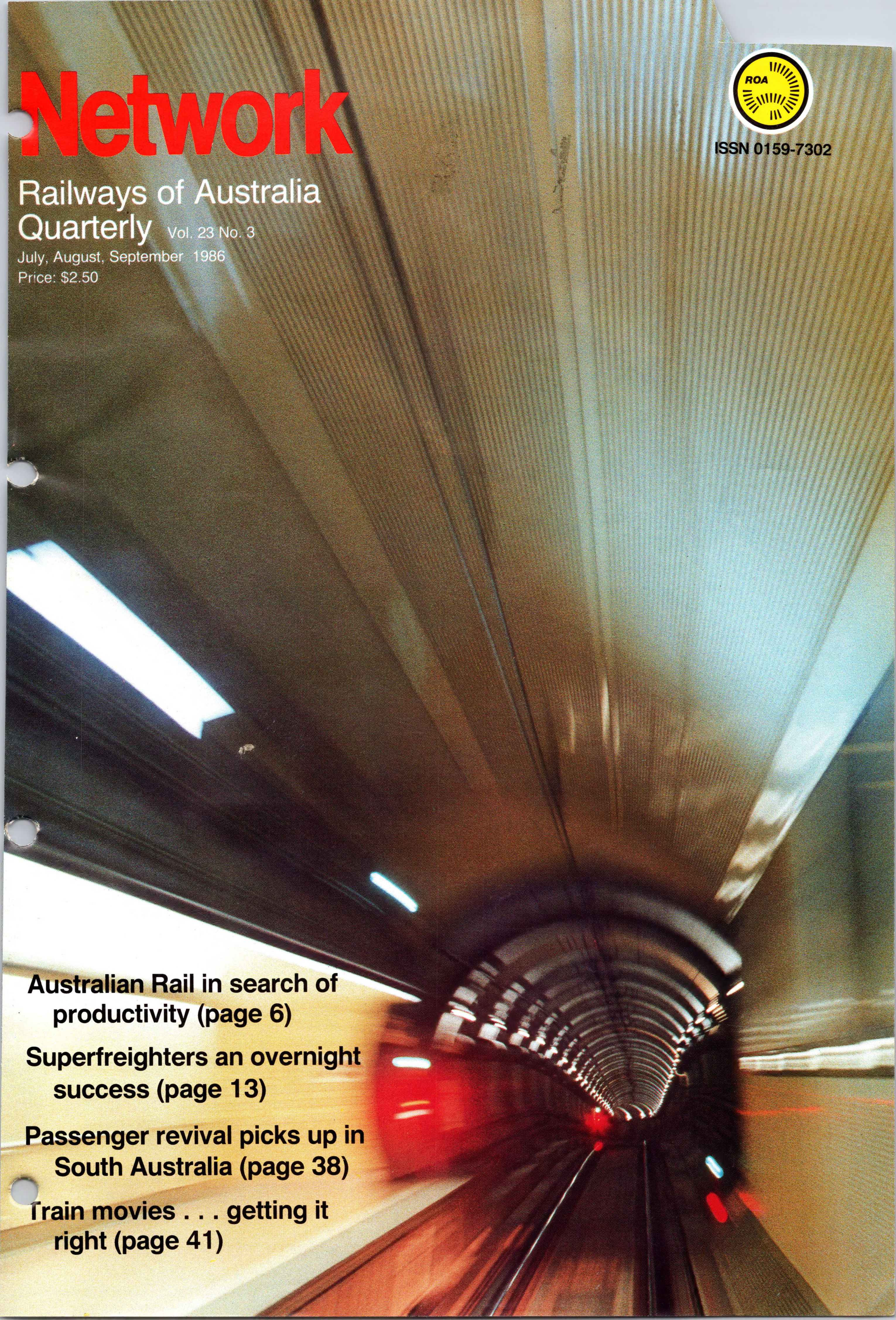

Australian Rail in search of productivity (page 6)

Superfreighters an overnight success (page 13)

Passenger revival picks up in South Australia (page 38)

Train movies . . . getting it right (page 41)

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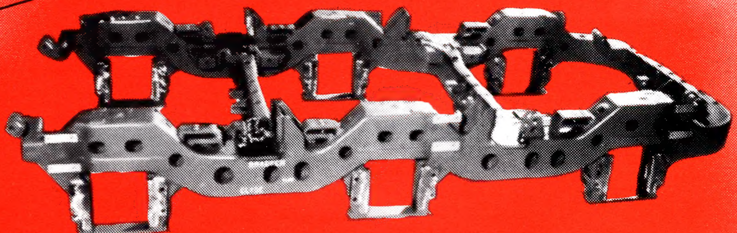

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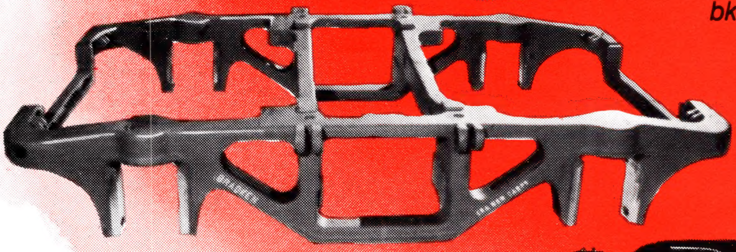

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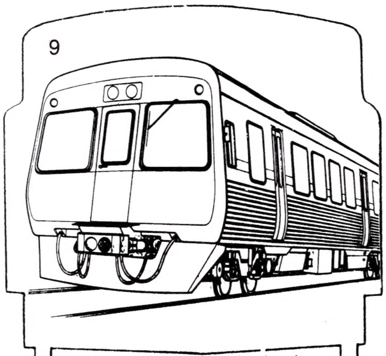

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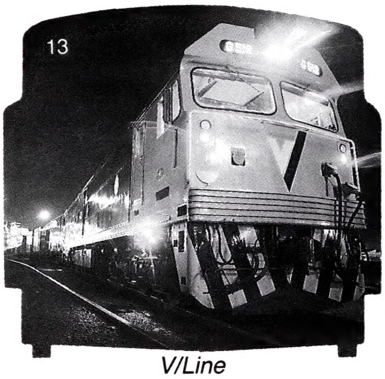

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Front Cover:

Surrealistic imagery in Melbourne's Underground Loop... The driver's view leaving Museum Station for Flagstaff. (Taken on Mamiya RV-67 ½ second at F11. Kodacolor ASA 400)

Our only requirement of writers and personalities who contribute to Network is that they be informative or entertaining and that their subject has relevance to the wide interests of railwaymen today. Naturally, there will be occasions when their viewpoints or opinions run contrary to those of the editor or to Railways of Australia. We must accept that these differences are among the elements essential to the presentation of a lively and interesting magazine.

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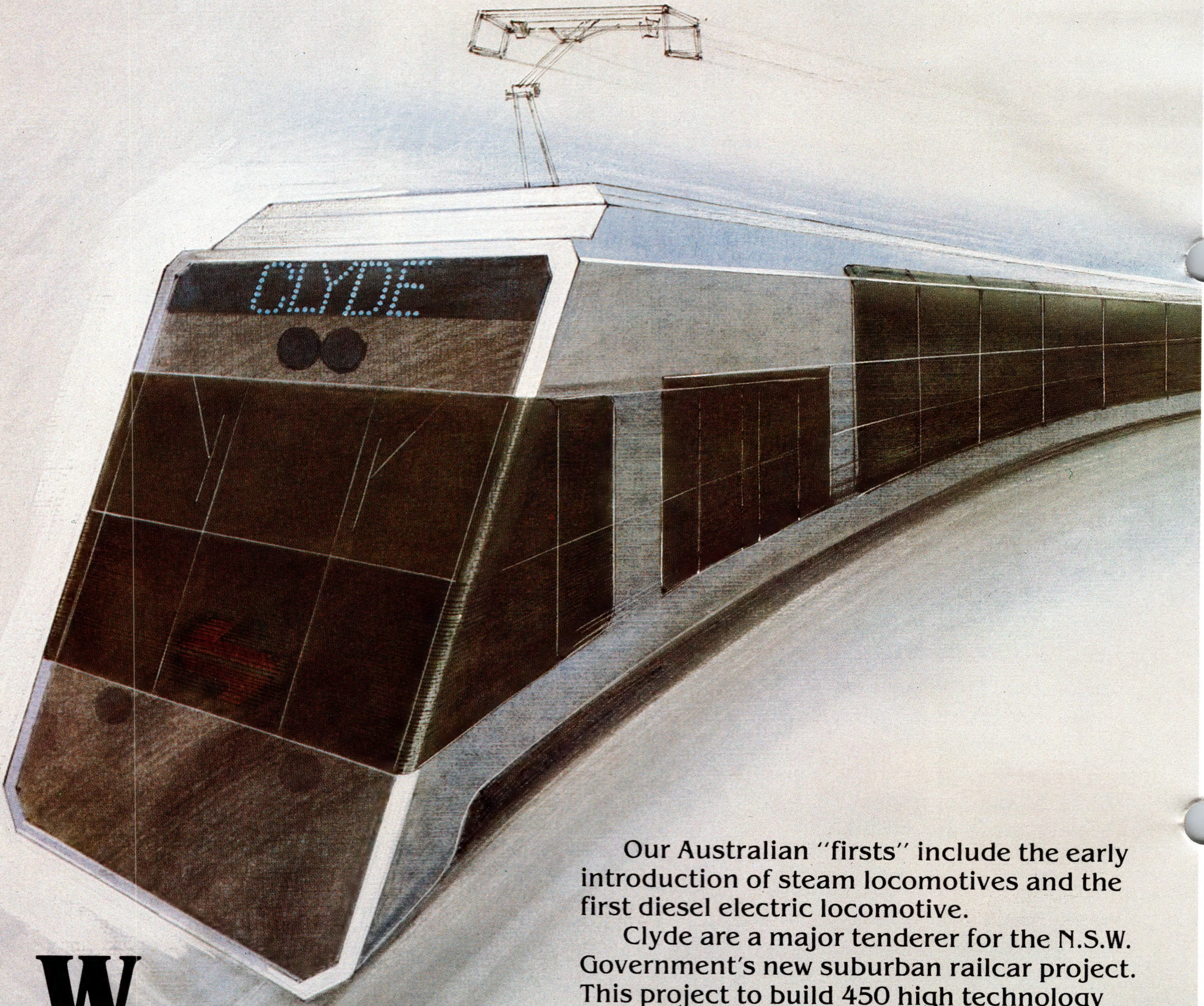

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The
EXECUTIVE DIRECTOR'S
column

Little things, says the song, mean a lot

"Little" things are an important part of the overall task of the Railways of Australia Committee.

If, for example, the Standards Association of Australia wants a rail opinion on any proposal to adopt a new standard, or to vary an existing one, it is to Railways of Australia that they turn.

ROA has representation on many of the numerous Committees and sub-committees through which the SAA operates.

Specialist technical staff are drawn from one or perhaps two Systems to represent rail in each SAA Committee - they consult if necessary with colleagues throughout Australia, and a finite ROA contribution is made.

Dangerous Goods - their handling and transport - is another area where ROA is called upon for input.

A special committee, with representations from all Systems, meets to ensure that operating specifications and techniques are uniform throughout Australia and that, where possible, these are in conformity with those of other transport modes - notably road and sea.

The committee takes account of changing customer needs, changing packaging practices, changing product characteristics.

ROA can then ensure that rail's reputation for safe movement of goods requiring specialist care is maintained.

Railways of Australia has been a strong supporter of the Australian Welding Research Association.

In any engineering context, welding of componentry is vital - and no more so than in the rail sphere. For this reason, ROA is happy to contribute its share towards ensuring that welding techniques are being continually improved.

ROA acts on behalf of its members in specific, "one off", instances.

Electricity Supply Authorities throughout Australia are often required to place power lines across railway rights-of-way.

In doing so, it is important that railway signalling is not interfered with or put at risk, and even more importantly in electrified areas, the catenary is protected.

For these reasons, and acting in conjunction with the Electricity Supply Authorities Association, common standards are being developed to ensure protection for rail and access for electricity supplies.

Increasingly important in the rail communications scene is the use of two-way radio.

The growth and use of this medium has brought pressure to bear on Telecom - who are responsible for allocating frequencies over a wide spectrum of users of radio.

Through ROA a common approach has been reached so that the same frequencies are available for similar purposes throughout Australia - their use, in effect, has been rationalised.

In all of these ways and in others, as well as in its major on-going tasks, ROA provides the medium through which commonality is achieved.

Michael Schrader

M.C.G. SCHRADER
EXECUTIVE DIRECTOR

M. C. G. Schrader

reducing

Australian rail in se

Railways during the 1970's in Australia have been one of the growth industries.
This growth has been fuelled by the demand for export commodities - coal, wheat, ores - and as a result unit trains are now the dominant tonnage carriers.

Countering the trend of increased productivity which has resulted from higher tonnages being moved with a slightly reduced workforce (Fig. 1) has been the increasing cost of labour.

The dilemma — increasing real labour costs. Throughout the 1970's and into the 1980's real wages increased throughout the Australian workforce. This effect was also evident within railways (Fig. 2) where the *average annual growth in labour costs over the period was 3.6% in real terms.*

As a result despite the small percentage reduction in the workforce there has only been a small real cost reduction per tonne, on average while in some states where traffic growth has been small real costs increased over the period.

This growth in real labour costs is undoubtedly the major reason for the continuing overall rail deficits within Australian rail systems.

It also means that the search for productivity gains and staff reductions within railways must continue despite the significant overall performance gains that have been obtained, and it is in this context that there is a continuing need for research particularly in engineering areas.

1986 Rail Track Conference. In March the Rail Track Association convened a conference in Melbourne at which railway systems and suppliers were well represented.

The conference theme - 'The Challenge of the Future' - was most appropriate given rail's financial position.

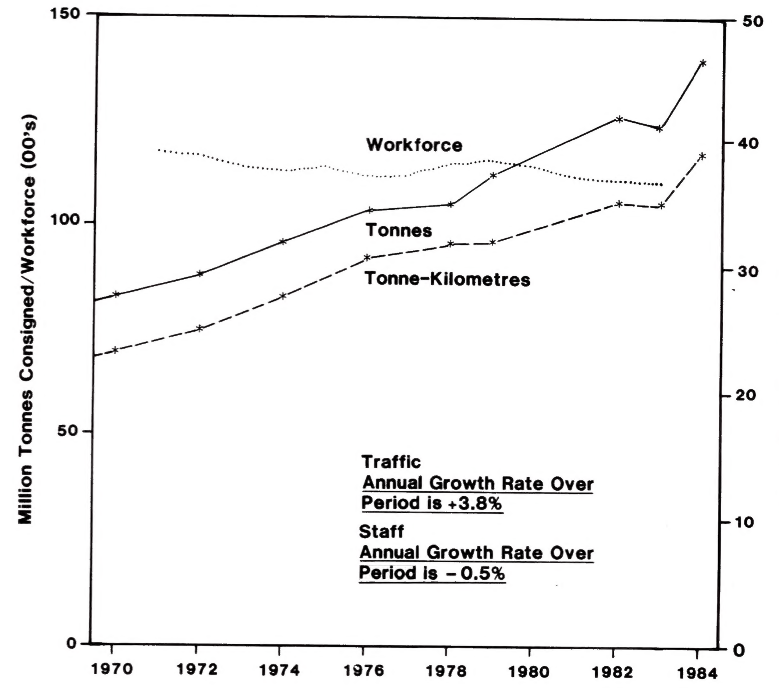

Figure 1= Growth in Government Rail Traffic and Workforce since 1970.

The Conference provided a good overview of current engineering developments in the Rail Track area including:

- high speed non-contact rail head measurement,
- the development of new timber preservatives,
- rail finite element modelling,
- computer prediction of sleeper replacement requirements,
- the development of resilient rail pads,
- rail grinding/profiling, and
- new wheel and raw materials.

As well other papers provided an overview of the developments being undertaken within rail systems, including their research activities into new timber sleeper fastenings, higher speed operations and optimisation studies of track maintenance practices.

Computer-Based developments. Two computer-based developments, mentioned at the Conference, and likely to have a significant impact on railway operations in future years are:

- the 'Driver Assist Project' at Mt Newman Mining, and
- the 'Computer Model for the Prediction of Sleeper Replacement' at the Canadian Institute of Guided Ground Transport.

The 'Driver Assist Project' entails the development of a computer based system which will provide additional information to a driver in the locomotive cab to assist him to choose those control actions that optimise the behaviour of the train.
A fundamental element in the technology is an algorithm which will predict the best methods of driving a train to satisfy all of the real constraints while minimising fuel consumption and coupler damage.
This ACET project is an extension of earlier research including the development of the train driving simulator and locomotive loggers. (Fig. 3)
As the 'Driver Assist Project' will be integrated with the development of the Centralised Traffic Control (CTC) system the planning has necessitated outlining development options for the CTC system over an extended time period.

'CONTINUING NEED FOR RESEARCH

arch of productivity

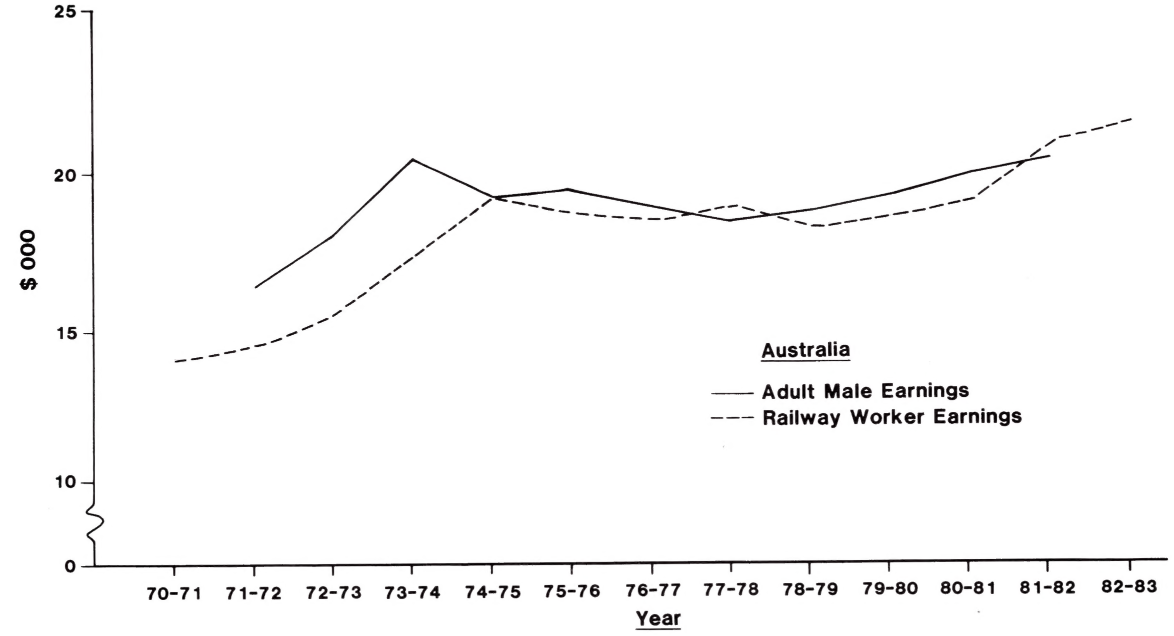

Figure 2: **Average Annual Earnings for Railway workers and Adult Australian Males (Source:ARRDO, 1985)**

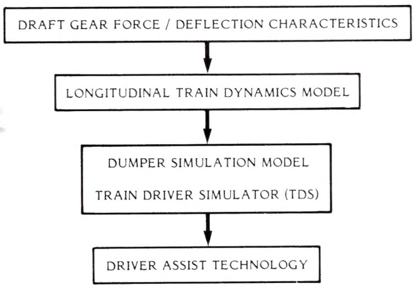
DRAFT GEAR FORCE / DEFLECTION CHARACTERISTICS
LONGITUDINAL TRAIN DYNAMICS MODEL
DUMPER SIMULATION MODEL
TRAIN DRIVER SIMULATOR (TDS)
DRIVER ASSIST TECHNOLOGY

Figure 3: Development of Models (ACET)

This definition has recently been carried out by 'Transmark' engineering consultants in conjunction with Mt Newman Signals and Communications Department engineers.

Recommendations include incorporating computer based equipment into a modified CTC system and also the provision of VDU's to facilitate the train control function.

In Australia there are approximately 80 million sleepers installed in track. The replacement value of these sleepers would be about $3 Billion (when installation costs are included). Traditionally most rail systems have tended to use spot replacement methods, particularly on branch lines and management of the resource has been based on allocative criteria in districts.

The Canadian development, adopts a new approach by attempting to synthesize current knowledge of sleeper/track behaviour into a sleeper damage model which enables the effects of various sleeper replacement strategies, increased traffic loading, and increased tonnages to be quantitatively evaluated.

Figure 4 outlines the loading environment which has been modelled by CIGGT.

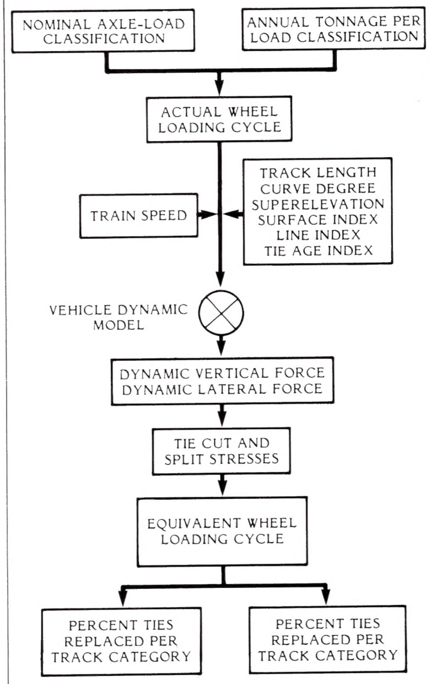
NOMINAL AXLE-LOAD CLASSIFICATION
ANNUAL TONNAGE PER LOAD CLASSIFICATION
ACTUAL WHEEL LOADING CYCLE
TRAIN SPEED
TRACK LENGTH
CURVE DEGREE
SUPERELEVATION
SURFACE INDEX
LINE INDEX
TIE AGE INDEX
VEHICLE DYNAMIC MODEL
DYNAMIC VERTICAL FORCE
DYNAMIC LATERAL FORCE
TIE CUT AND SPLIT STRESSES
EQUIVALENT WHEEL LOADING CYCLE
PERCENT TIES REPLACED PER TRACK CATEGORY
PERCENT TIES REPLACED PER TRACK CATEGORY

Fig. 4: Sleeper (Tie) Life Calculation Flowchart

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South Australia buys new railcars

The State Transport Authority of South Australia (S.T.A.S.A.) has entered into a contract with Comeng, South Australia for the design, manufacture and commissioning of twenty new diesel electric railcars to replace some of its aging fleet of 300 and 860 class 'Redhen' railcars.

All twenty railcars will be powered, but eight railcars (3000 class) will have driver's cabs at both ends and twelve railcars (3100 class) will have a driver's cab at one end only.

The 3100 Class Railcars will be semi-permanently coupled to form six two-car units.

These railcars with a design maximum track speed of 100 km/h, will be used on the Adelaide metropolitan railway network for the suburban passenger service.

The design is based on the Melbourne metropolitan EMU railcars (currently in production) with modifications to meet the STASA operating requirements.

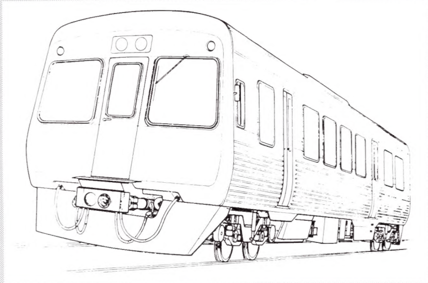
It is the first time in Australia that railcars have been powered by Alternating Current traction motors deriving their power from an on-board diesel driven alternator.

All railcars will have a Mercedes-Benz model OM-444-LA diesel engine, directly coupled to a Reliance Alternator which produces the necessary electric energy for traction and auxiliary power requirements.

The engine-alternator unit runs at a constant speed of 1500 rpm to produce an AC power supply at 660 V and 50 Hz.

The power for traction is when fed into a Stromberg rectifier/inverter unit having a variable voltage and variable frequency output to the two (2) Stromberg, bogie mounted, electric traction motors.

'Design is based on Melbourne Metro EMU's'



By varying the frequency and voltage, this produces the necessary positive torque for acceleration or negative torque for a high portion of the braking effort.

The application of negative torque (electric brake) on the bogie traction motors is sufficient to stop the railcar under most circumstances.

Wheel mounted disc brakes are fitted to all axles to provide the additional braking effort (mechanical brake) required at higher track speeds.

The disc brakes also work as a holding brake when the railcar comes to a standstill.

Anti-wheel spin/slide detection equipment is fitted to all axles to provide an interfacing signal to both the electric and mechanical braking systems to produce the minimum stopping distance under all track conditions.

Design deceleration rates are 0.9 m/sec^2 for a full service brake application and 1.1 m/sec^2 for an emergency brake application.

A separate, spring applied, air release parking brake is fitted to each bogie for use when the railcars are stabled. The mechanical brake equipment is supplied by Knorr-Bremse.

Intercar coupling is achieved by using the Scharfenberg fully automatic couplers. The units automatically provide the mechanical coupling of railcars and the coupling of trainlined airpipes and electrical cables.

The coupling process is remotely controlled from the driver's compartment.

Combinations of up to six (6) 3000 or 3100 Class Railcars can be coupled to form a train. The number of railcars is restricted because of the system platform lengths.

Bogies are a fabricated, lightweight, bolsterless design manufactured by Comeng under licence from Linke-Hofmann-Busch (LHB) of Germany. The primary suspension is Clouth rubber springs and the secondary suspension is Continental air bag springs. On each railcar, one bogie is driven and the other is a trailer bogie.

A driver's cab and guard's compartment is provided at both ends of the 3000 Class and at one end of the 3100 Class Railcars. This arrangement provides for the driver to close the full width of the leading end of the train off from the public when required, but allows access for intercar staff and passenger movements when the railcars are operating in multiple units.

The guard can also close off the end of the train to form the guard's compartment when required.

Wool fabric covered saloon seating in the 3000 and 3100 Class Railcars have a capacity of 105 and 113 passengers respectively.

This includes two seats per guard's compartment which can be utilised by the public when the guard's compartment is not in use in multiple unit trains.

The new railcars are scheduled for delivery during the period November, 1986 to January, 1988. Provision has been made for this initial order to be extended by an additional eighty railcars subject to the first railcars operating in a satisfactory manner over a two year period and finance being made available.

The aging fleet of 300, 400 and 860 class 'Redhen' railcars will be progressively retired as the new cars are commissioned.

Provision made for additional 80 railcars

rapid

The NSW Acting Premier and Minister for Transport, Mr Ron Mulock, has announced a massive modernisation programme of State Rail's country and interstate trains.

Mr Mulock said 14 new generation XPT high performance, long distance passenger trains will be brought into service over the next 10 years, at a cost of $250 million.

Tenders for these will be called in the near future.

Together with the existing XPT fleet, the new trains will replace almost the entire country and interstate fleet.

The new trains will mean the most significant upgrading of long distance trains in the railways' 130 year history.

They will make NSW rail services comparable to the most modern, comfortable and efficient in the world.

Mr Mulock said the new super fleet would cater for the projected population growth in NSW and would provide an increase in seating capacity on country and interstate services of almost 50 per cent.

The additional fleet size follows the unprecedented growth in passenger business with the XPT.

Patronage on all State Rail's XPT country passenger trains rose by 58 per cent during the past year.

On some services passenger business improved by up to 292 per cent.

"Already the present XPT has shown itself to be the most successful train in the history of the NSW railways," Mr Mulock said.

"The six trains presently in service are the most highly visible, strongly approved innovation ever initiated by State Rail.

"Tenders for the new super trains will be called in the next few weeks and the first models will roll off the production line from early 1988, with the last train expected in 1995.

"The new trains will replace all the current diesel-hauled express services, as well as interstate trains to Brisbane and Melbourne, cutting travelling times dramatically and providing luxury travel facilities.

"With a capacity of up to 400 passengers, the trains will have a much lower operating cost per passenger than present conventional trains which carry between 105 and 305 travellers.

"Three hours will be cut from the present journey times from Sydney to Melbourne and Sydney to Brisbane.

"The new trains will bring world-class comfort to rail travel.

"All seats will be rotating and reclining, similar to those fitted on the latest XPT carriages.

"A new design buffet/dining car will serve both sit-down and takeaway meals.

"First class sleeper accommodation will also be provided on some long distance and interstate services.

"Facilities for disabled passengers will include storage for wheelchairs, special toilet facilities and other improved amenities.

"The new high performance trains are part of the major upgrading of the NSW rail system which has been

State Rail up and running with XPT ...

undertaken by the Labor Government," Mr Mulock said.

"In the past four years State Rail has cut its annual operating losses by more than $100 million but at the same time has continued to upgrade rail services.

"The introduction of the new fleet is designed to take NSW country rail travel into the 21st century," he added.

New or additional XPT services will operate between Sydney and:

- The North Coast to Murwillumbah and Brisbane.
- The North West to Tamworth and to Armidale.
- The West to Bathurst, Orange and Dubbo.
- The South to Wagga, Albury and Melbourne.
- To Canberra and the Southern Highlands.

Detailed planning and extensive market research will precede the introduction of the new timetables for the upgraded country services.

V/Line, the Victorian Railways, has agreed to contribute the purchase cost of one of the new trains.

The State Government has already approved the purchase of 12 additional XPT carriages for present services.

The first of these carriages will be delivered to State Rail by August this year, and the full order by January 1987.

The new carriages will increase seating capacity on the existing XPT fleet by more than 100 seats on every train.

State Rail has announced it will achieve a cut of $35M in its operating losses this financial year and for the first time earn more than $1,000M.

These targets were set by State Rail in the 1985/86 financial year which ended on June 30.

It is the third successive year that rail losses have been reduced and follows decades of rapidly escalating rail losses.

Annual operating losses are now almost $120 million below the level of three years ago, a drop in real terms of almost 50 per cent.

State Rail Chief Executive, David Hill, said the Government contribution of 40 per cent of rail operating costs had now been reduced to around 20 per cent.

Biggest earner for the railways is freight business, expected to earn $733 million this year, an increase of 14.3 per cent over the preceding year.

Passenger business has also been boosted and is expected to earn $280 million this year, up 15.5 per cent on last year.

"Suburban weekly ticket sales are up almost 10 per cent on the last financial year," Mr Hill said.

"But our strongest growth is on the popular XPT services, where patronage is up more than 50 per cent.

Figures on rail operating deficits for the past four years are:

1982/83	$448 million
1983/84	$395 million
1984/85	$365 million
1985/86	$330 million (Projected)

Mr Hill said State Rail management was delighted with the result.

"There has been a lot of effort from a lot of people."

"We set a very tough target for this financial year, and we've achieved it."

Mr Hill said the improved result followed a successful dual strategy of reducing costs and increasing revenue.

"We have met or exceeded our revenue targets in almost all areas."

"State Rail provides Australia's most comprehensive freight service and hauls export coal, wheat, iron and steel, domestic and overseas containers, cement, flour, wool, fruit, vegetables, milk, timber, motor vehicles, livestock, petrol, fertilisers, parcels and general freight.

"We are particularly pleased with interstate freight business, with earnings up almost 15 per cent," he said.

"This is an area where we face fierce competition from road haulers."

"Last year we introduced the 'Super Freighter', an express container train linking Sydney with Melbourne, Adelaide, Perth and Brisbane."

"For almost 30 years road haulers have taken rail business, now we are beginning to win some of it back."

The State Rail Chief Executive said a vital part of strategy was continued improvements in rail efficiency and cost reductions.

"We must keep expenditure growth below revenue growth if deficits are to be brought under control."

"State Rail is in the process of introducing more efficiency programmes and these are important in holding down costs."

Mr Hill said credit should go to all railway employees and to many rail union officials.

"It is a shame that a few celebrated disputes have given the impression of total resistance by the unions."

"The truth is that a large number of rail union officials support modernisation and change."

"They fully appreciate that unless the railways becomes more efficient its potential to provide jobs will be reduced."

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CHANGES AT ROAC H.Q.

After almost six years with the Railways of Australia Committee and a total of forty-four years service to railways, Mr Bart Plunkett retires from the position of Deputy Director/Secretary early in July.

He joined ROA late in 1980 from VicRail where he was Manager of Marketing Planning. In his service with ROA he has earned the admiration and respect of senior officers in all Systems as well as the ROA staff.

Mr Williams has been appointed to the revised position of Secretary, ROAC. Bryan joined VicRail in 1958, and has been closely associated with all aspects of the Commercial and Marketing Divisions. Prior to his ROA appointment, he was V/Line's Manager of Marketing Administration.

He is no stranger to ROA as he has often represented V/Line at ROA meetings on freight matters. His personal interests includes membership of Kiwanis International, where he is the present Governor of the Australian District.

Bryan is 44 years of age, married with two daughters in their late teens.

Meanwhile, after twelve years at 325 Collins Street, the Railways of Australia Committee moved to the 4th floor of 85 Queen Street late in June. The CENWAG section of ROAC is also moving to Queen Street. For information on the new telephone, telex and FAX numbers, please check with Telecom, as these were not available at the time 'Network' went to press.

The National Freight Group will remain at the 9th floor of 303/317 Collins Street - Telephone (03) 614 4890.

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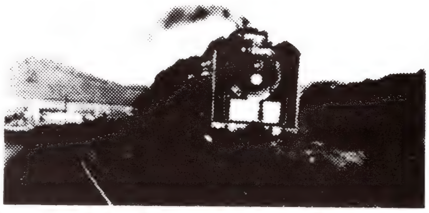

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V/Line's superfreighter's overnight success

In capturing a larger share of the interstate freight market, V/Line is counting on the Superfreighter container services.

The Superfreighters are block container trains on a regular overnight service between capital city-rail terminals.

Superfreighters offer next-day delivery in Sydney and two nights to Brisbane. There is an overnight service to Adelaide and three nights to Perth.

Cargo is accepted for transit up to one hour before the 7 p.m. departure time five nights a week.

V/Line's General Manager Freight Services, Terry Mulligan, said that interstate business already provided about one quarter of V/Line's $200 million a year freight revenue, 33 per cent of its tonnage and used less than 10 per cent of the Victorian rail line network.

It has a big growth potential under the impetus of growing national freight marketing opportunities.

The superfrieghter service is now a national network through which rail will substantially increase its share of general freight movement, particularly containerised freight between Melbourne, Sydney, Brisbane and Adelaide.

Mr Mulligan said: 'We're talking about a new generation of freight trains which are complete in themselves and eliminate the time wasting and costly shunting and marshalling of separate blocks of containers at different sidings.

'They also cut out the risk of damage in transit. Superfreighters are committed trains, running at passenger train speeds on a priority path along the intercapital corridors. They have the highest percentage reliability of timing and embody the concept of rail having a greater advantage over road on the long hauls.

'Reliability is seen to be the single most important customer requirement for freight services, even more than efficiency, low risk of loss or damage, competitive prices and co-operative staff which are the hallmarks of the Superfreighter services.

'We have a dedicated freight force team under the leadership of Marinus Van Onsolen (formerly the General Manager of Tradex Transport Pty Ltd) with sales representatives Tony Gallow and John Maslin. The operations team at the South Dynon container terminal, led by Maurie Kick has developed into a really efficient unit for receiving and despatching containers.

'We have the expertise and we are working in closely with the railways in other States to create the best possible national network for freight movement.

Customers requiring general freight transport can go directly through V/Line or through a forwarding agent. They should specify the Superfreighter service. Customers may hire V/Line containers or use their own.

'Every business enterprise which transfers general freight tonnages interstate should consider the advantages of the Superfreighter services.'

In the present time and price sensitive market V/line is cost-competitive with road. To Sydney, for example, a 22-tonne capacity privately-owned container can currently be line hauled by V/Line for $356. Pick up and delivery charges, if required, amount to $196, so the overall door-to-door service is $552. For lightweight container loads (under 11 tonnes) the V/Line door-to-door rate for 'own containers' is $505.

Winning double for new generation train

State Rail's Royal Easter Show exhibit, featuring Sydney's new-generation Tangara train, pulled off a winning double this year.

It won "Best Exhibit in Show" and "Best Display by a Government or semi-Government Instrumentality". The exhibit was designed by display officers of State Rail's Corporate Relations Branch, and built by staff from Resident Engineer's office, Sydenham.

State Rail won the inaugural "Best Exhibit" award in 1982, and is the only exhibitor to win it twice.
This was the fifth year State Rail was up there with, or near, the Royal's exhibition winners.

Last year it gained a second in the "Best Display by a Government or semi-Government Instrumentality". In 1984 it was "Highly Commended", and the year before that it gained second place.

In 1982 it gained two firsts for "Best Commercial Exhibit" and "Best Exhibit" at the Royal Agricultural Society's century show celebrating 100 years at its present Moore Park site.

Close to a million people saw this year's futuristic State Rail exhibit, which included:

- a rotating one-third scale model of a Tangara carriage, lit by flashing helicopter lights;
- two 5½ inch gauge model Tangarra trains for childrens' rides on a figure-8 track about 100 metres long;
- staff in silver jump-suit uniforms as from a spacecraft;
- robots to tell children rail's safety message;
- a Rail Travel Centre information booth with a waterfall and miniature lake; and
- safety posters from schoolchildren.

Part of the exhibit showed the Urban Transit Authority's Metro Ten proposed ticketing system, and a video of a speeded-up bus ride through Sydney's streets.
The childrens' trains, seating about 18 a ride, are estimated to have carried about 75,000 passengers over 300 kms during the 12 days of the Show.

New maintenance site for Tangara

A 30-hectare site near St Mary's will become the maintenance centre for Sydney's new Tangara train.

Part of the land is on the recently-closed Rope's Creek line - owned by the Commonwealth.

"An industrial engineering study to determine preliminary design of the centre should be completed by November", said Mr Tony Spaccavento, project manager, Tangara.

"After final design, construction of the centre should be completed in 1988.

"Tenders closed on November 27 last year for the $600 million contract for 450 Tangara carriages and ancillary items.

"The Government is expected to announce the successful tenderer by the end of July.

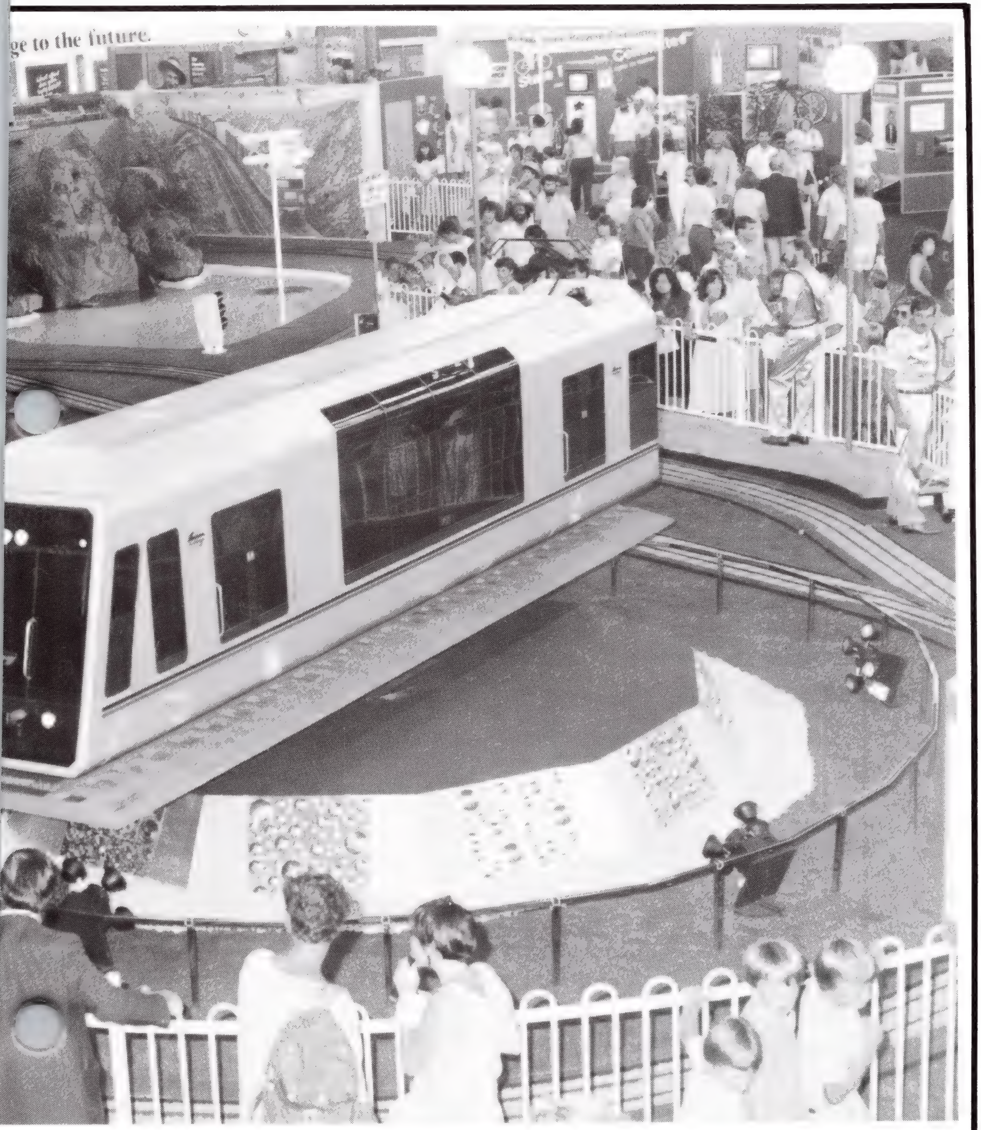
"Tangara trains will be delivered from successful tenderer/s about 12 months after contracts are let.

"The trains will be tested and go into service before 1988.

"About one four-car set will be delivered each month.

"For the first time in a major State Rail project, a Tangara contractor will be required to conduct a 'quality assurance program' to cover the manufacture of this product.

"By controlling all phases of production, this will ensure a high quality product from the manufacturer and better utilisation of State Rail technical staff", Mr Spaccavento said.



Australian companies Comeng, Clyde Engineering and Goninan & Co. are the major tenderers, with sub-contractors' submissions coming from Europe, Japan, U.S.A. and Australia.

State Rail engaged stylists in a world-wide competition for the general design and appearance of the Tangara.

Thirty-four entries from Australia, France, Japan, U.S.A., Italy, Germany and the U.K. were reduced to a short-list of five. A British design was eventually selected.

The immense scope of the Tangara project can be seen from the three tonnes of documents received by State Rail from the tenderers.

The tender specifications took 12 months to prepare and included the train's:

- car body and underframe;
- interior;
- traction control equipment;
- motors;
- auxiliary power supplies;
- communications systems;
- bogies;
- brakes;
- air-conditioning;
- automatic doors;
- on-board signalling; and
- general electrical equipment.

Australian and overseas companies were invited to submit their ideas and proposals based on preliminary State Rail requirements.

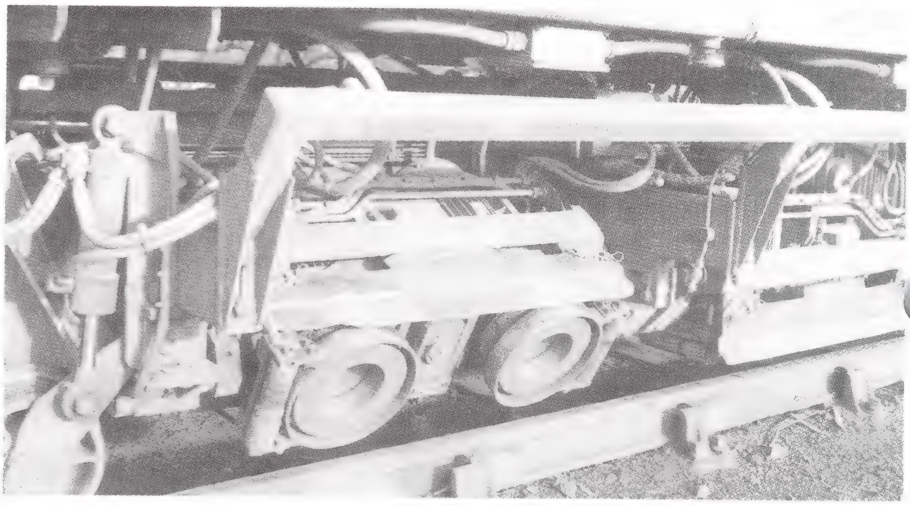
Before final specifications were prepared, ideas were canvassed from officers sent abroad on various study tours to study latest trends in technology and train development.

Up to 46 people on the Tangara team worked to a strict time schedule to evaluate the submissions.

The team included State Rail technical, operations and commercial experts from Mechanical Operations, Signals, Finance, Electrical and Way and Works Branches, and outside consultants.

Versatile grinding on t

The URR-48-4 has continuous grindstone motor position control and transverse head profile monitoring.



Grindstone motors are designed to be controlled hydraulically as a pair.

With a continuing requirement to maintain a good railhead profile and eliminate corrugation, British Rail (BR) has hired a third rail grinding train under a renewable five-year contract from Speno, Switzerland. Designated URR48-4, the 48-grindstone train is the most modern in Europe and has two important features which will make it far more flexible and versatile than was previously possible. These are continuous grindstone motor position control from inside the driving cab, and transverse head profile monitoring allowing a constant check of grinding. The train also features automatic load control, obstacle monitoring, and a new type of grinding stone with higher metal removal capacity and longer life expectancy.

The train is currently allocated to BR's southern region, most of which is electrified at 750V dc third rail. The region operates an intensive service of stopping and limited-stop commuter trains using mainly emus. Rails tend to wear to a flat running surface profile and experience corrugation.

The new train comprises four cars. Each vehicle is mounted on bogies — the two earlier trains are composed of two axle vehicles. The train is about 69m long and has three power cars for transmission or grinding power supply.

The first power car contains one of the driving cabs with its associated stone and motor controls. It also has a transverse profile monitor display and a corrugation measurement output information unit. The remainder of the vehicle is fitted with a compartment for BR staff, a store room, and a main engine room.

The grinding stones are fitted beneath the remaining three cars. All auxiliary power is generated in the second power car. This vehicle also houses an air compressor, and the second transmission/main generator. The third vehicle is a trailer coach dedicated to the living accommodation for the six Speno crew members. It has three bedrooms, a toilet, shower, kitchen, and dining area. The fourth vehicle comprises a power car with driving and control cab, and a workshop.

All the hydraulic and power couplings between the cars are contained within a flexible concertina surround. This eliminates the build-up of grinding dust on the many hydraulic, air, and electrical couplings in this area, and keeps them clean for maintenance work.

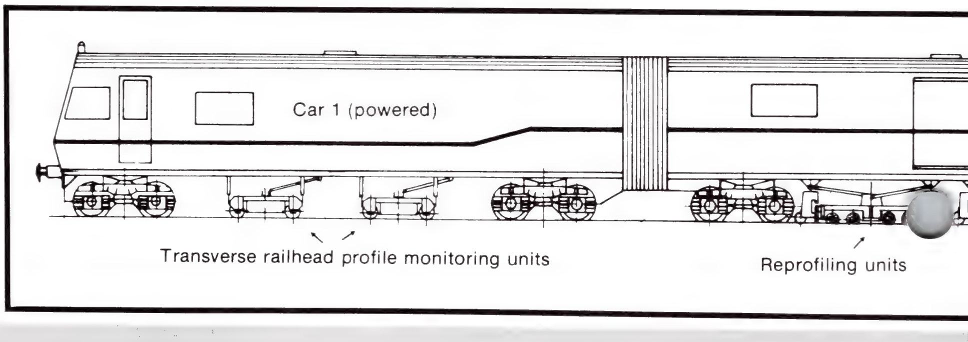
Transmission is mechanical when travelling between sites at speeds up to 80km/h, but is changed to hydraulic, with separate electric supply for the grinding motors, when working. During grinding, the train's speed is maintained at a constant 7km/h by an automatic speed control device.

The main engines are manufactured by Caterpillar, United States, and are turbocharged to give a maximum output of 345kW at 1800rev/min. The 24 grinding motors on each side are arranged in banks of four on pairs of chassis under three of the vehicles.

On the earlier grinding trains it is necessary to predetermine the position of the grindstones and the consequent angle they would grind at. This is carried out prior to grinding since the motors have to be positioned and mechanically clamped. The only variability is in the Patin stones which concentrate on the top of the railhead. These can be locked as a set, and then turned through an angle of plus or minus 4°. This gives a very limited, but useful capability.

The new train has a significantly different arrangement. Each chassis of four grindstones is subdivided into two pairs of motors. Each pair has to be clamped in position, the subtended angle between them being determined at this point. This, as with the other trains, has to be carried out before work starts.

However, while the two motors are locked in relation to each other, they can be controlled hydraulically as a pair. With this control, the motors can be rotated through an arc of about 130° depending on external constraints. This angle has to be



e move for British Rail

covered in two swings each of about 65°. The transfer from one angle range to the next is by repositioning a link arm on the grinding chassis.

With the high-power motors (15kW) on this train, BR is limited to about 25° to the horizontal on the gauge face. This restriction is due to the physical size of the motors. The outermost angle differs slightly between areas where there is or is not a conductor rail. The angles are about 115° to 125° measured from the horizontal on the gauge face. Consequently a controllable angle of operation of some 90° to 100° is useable. With this independent facility of control it is possible to concentrate the stones into particular positions and thereby optimise the specific pressure and work. This feature would still be difficult to control if it were not for the transverse railhead profile monitor. This car, monitors the running surface profile of the railhead by means of 10 small hardened steel nibs spaced equally across the width of the railhead from about 12mm down the gauge face to 3mm down the outer edge. Each nib is linked through a pivot system to an eddy current proximity detector by means of a small distance plate. The signal output level on each of the channels can be adjusted by changing the position of the detector.

Illuminated Readings

For initial calibration purposes, a drawing of an as-new railhead profile is fitted to the equipment. The gains are then adjusted to give a straight line reading across the centre of a series of 10 LED columns on a bargraph — the URR48-4 is the first Speno grinding train to have such a facility. With the columns set at their centre calibration height, the digital indicator values of the controlling potentiometers are noted. This process can also be used if a running surface profile different from the standard is required since the characteristics of the various potentiometers are known.

Each column is associated with its appropriate nib. The columns are divided into 30 segments and four colour bands. The colour bands indicated deviations from the calibrated profile (see table). This gives an overall range of 7.5mm for each measuring point. The stepping accuracy in the column is not linear and is at its maximum in the range -0.5mm to +1mm.

As grinding progresses, each detector tracks along the running surface and indicates its position relative to a central loading point. A flattened running surface will produce higher readings on the bargraph at the gauge and outer corners of the head. This facility makes it easy to position the grindstones in these areas to concentrate their work efficiently.

With this controllability it is not necessary to measure the profile present, determine the required finish profile, and set the potentiometers accordingly. All that remains to produce the required profile is to grind the rails to a situation where all columns are of equal height across the centre of the bargraph.

The initial plan is to grind the head profile to one of six sets stored in the equipment with the intention of expanding its capability with experience.

Simultaneously with transverse head profile monitoring, both long and short wave corrugation measurement and its rate of removal are monitored. Corrugation is measured by a four point system, similar to that used on portable equipment. Again, because of the system's inherent flexibility, corrugation removal can be maximised.

As experience with the train is gained, it is expected that further advantages will become apparent.

Later this year, the continuous control of the grindstone motor position will be computerised. This will allow the operator to select at the touch of a button one of six pre-determined profile patterns. The train will then grind the rail to the selected profile. Automating this function will save time and make is possible to use the grinding settings more effectively.

Another likely improvement concerns the grindstones. The transverse profile capability enables the specific pressure at which the stones are worked to be maximised. This should make it possible to use harder stones with a consequent improvement in the rate of metal removal and increased stone life without the associated glazing of the stones. (The specific pressure has an upper limit which has to be watched to ensure that no burning of the rail takes place.)

The transverse profile facility offers a further opportunity to grind the running surfaces of the rails in curves and transitions to an asymmetric profile.

When applied correctly, this will improve the ride of trains and minimise their loading on the track with consequent reduction in maintenance requirements.

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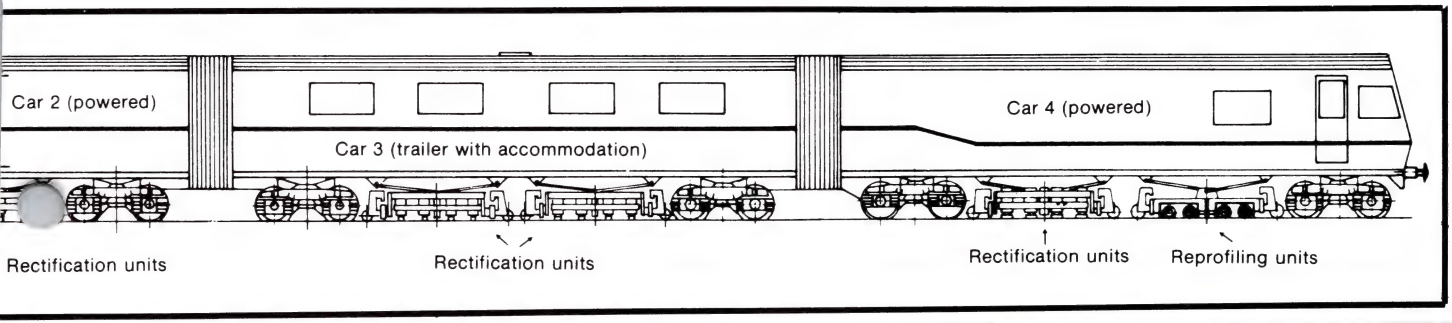


refurbishing

Interim survival plan for Westrail's Metro fleet

Westrail is moving to keep its suburban pasenger fleet up to scratch until the metropolitan service is electrified.

Steps being taken now will also ensure Westrail is able to cope with the America's Cup workload.

The State Government announced late last year that the metropolitan passenger service would be electrified at a cost of $146 million.

Planning began immediately and it was stated the first electric trains should run early in 1989.

The decision ended the purchase of new diesel vehicles.

But until the phase-in of electrification, Westrail needs to maintain a viable suburban service at a standard comparable to today's.

This means expenditure on refurbishment to extend the life of some of the older vehicles until electric cars can be obtained and commissioned.

The Mechanical Branch examined in detail several options to determine the best way to provide services leading up to the electrification changeover.

Negotiations have already commenced with Queensland Railways to hire 12 stainless steel locomotive hauled coaches for a four-year period from mid-1986.

These would be used to supplement the existing vehicle fleet, initially for the America's Cup period when Westrail will be under heavy pressure.
The experts say that up to 1.2 million visitors will be in the Perth region between October this year and February 1987.

In the meantime, Westrail will go ahead with the selected option to renovate its own fleet of 77 suburban power cars and trailers and 13 locomotive hauled coaches.

The fleet has an age range of just over 12 months for the latest additions, to more than 30 years.

Traction Engineer Mike Beavan says the need is to "maintain railcar reliability" for another four years.

He says new diesel engines will be purchased and installed in a number of older cars.

Orders for the engines will be placed soon.

"The basic aim is to keep cars in sound mechanical order and of presentable appearance and comfort", Mr Beavan said.

"We must ensure that the service does not suffer during the transition period."

"Obviously the prime aim is to retain rail patronage."

Electrification will not be an overnight process.

As the electrification programme is implemented, old railcars will be progressively released from service.

energy

Shelf gas hits Westrail's coal freight

The arrival of North West Shelf gas is having a damaging impact on Westrail revenue and operations.

The SEC is using gas for power generation instead of coal. Heavy industry is also substituting gas for coal and oil.

As a result, Westrail coal and oil tonnages have been slashed, bringing the loss of about 20 bulk-haul trains a week or 1,000 a year.

At today's values, the revenue loss to Westrail will be $17.6 million a year, or about seven per cent of projected total revenue for 1985/86.

Westrail coal haulage will drop by 1.1 million tonnes in a full year and oil will be down by about 250,000 tonnes.

Together, that is also about seven per cent of Westrail's total annual tonnage.

There is no way Westrail can immediately compensate for the loss of these markets, which is the biggest blow to Westrail since the closure of the Koolyanobbing iron ore mine a few years ago.

At its peak, Koolyanobbing was worth two million tonnes a year to the railway.

Coupled with a current reduction in bauxite tonnage, due to a world downturn in the aluminium industry, the loss of the major coal and oil markets has created a harsh economic and operational environment for Westrail.

The loss of the coal markets has meant a reduction in the number of crews at Collie and the closure on January 28 of the Pinjarra crew depot.

Project Development Manager Theo Cook acknowledges the severity of the problem but also looks to the future.

He believes Westrail can again build up coal tonnages if a State Government investigation into possible overseas markets for coal produces a firm result.

Coal would almost certainly be exported through the Port of Bunbury and Westrail would have a major role to play.

Mr Cook says the proposal for an ammonia and urea plant for the South West is also good news for Westrail.

North West Shelf gas would be the feed-stock for such a plant.

This would allow the SEC to return to the use of coal at Kwinana and restore the lost tonnage and revenue to Westrail.

luxury

VIP car makes novel meetings venue

Novelty, comfort and economy blend in V/Line's luxurious Norman car which once transported royalty and has been restored as a mobile venue for business or social uses, including conferences and seminars or group travel to sporting fixtures.

The Norman car, 'new' since last October, has been in railway service since 1937 when it was a parlor car on the Spirit of Progress.

After a varied history as lounge car, club car and VIP car for royalty and vice-royalty, it was taken in hand by artisans at Newport Workshops and emerged, refurbished, last year as a first-class car for business purposes and upmarket social functions.

While it is anticipated that users will be principally corporate groups hiring it for such occasions as seminars and conferences, the Norman car has already been booked by a group of professional and business people at Broken Hill to take them to this year's Melbourne Cup, with sleeping accommodation to and from Mildura. Two full dinners and a champagne breakfast at Flemington are included as part of the package.

A recent user of the Norman car was the rural newspaper *Stock and Land* which chartered it for a day's run from Melbourne to Horsham carrying 30 people, with farming interests, to attend an agricultural field day.

Another business user was Australian Portland Cement Ltd, which took a party of clients to visit its Geelong plant.

With exterior livery of blue and gold, the car has interior fittings of polished woodwork, quality wooden tables, curtains and carpets, and red upholstered chairs to match the car's liquor bar.

The car is fully equipped with a modern kitchen to cater for anything from morning tea to a five-course, sit-down dinner. It is air-conditioned and carriers a catering staff as well as a conductor.

Equipment which can be used for business meetings includes projectors for slides, movies and video, with microphone and sound equipment.

The Norman car carries up to 30 passengers for a hiring fee of, usually, about $800-$1000 plus catering charges. This is an economic tariff since it provides travel as well as a venue, and enables groups to visit centres anywhere in Victoria which may be relevant to their meeting. The car may be booked for departure from the city or from any country station.

If the hiring group is larger than 30, additional carriages may be added and, if the booking is for a trip exceeding one day, a sleeping car can be attached.

The Norman car is attached to a normal passenger service or may be hauled by a chartered locomotive, steam or diesel, to any destination at any time, at a pre-arranged cost.

Markets Manager Rail Services, David Hardy, said: 'We'll encourage companies to hire the Norman car for seminars and sales functions.

'The ride in it has been smoothed by putting in lateral dampers to stabilise the sideways sway, so the coffee stays in the cup.

'Everybody, deep down, likes trains. We think this will catch on as an alternative venue for business seminars and social functions as it includes travel to a distant destination - which you can't do with a hotel venue in the city'.

Reservations for the Norman car or information about hiring may be made by telephone to V/Line's Charter Train Officer, Peter Hines, (03) 619 1207.

co-operation

Rail-air formula new concept in travel

By combining V/Line rail travel, to start a holiday, with TAA air travel for the homeward journey, a new concept in holiday making has been introduced by the two organisations.

The rail-flight holidays operate with rail on the outward journey from Melbourne to mainland States.

Rail travel is by the Southern Aurora (to Sydney), or the Overland (Adelaide).

These with the Brisbane Limited, Gold Coast MotoRail (Murwillumbah, for Gold Coast), the Trans Australian or Indian Pacific (Perth) and the Ghan (to Alice Springs).

Details of available holidays and fares are available from travel agencies and V/Line booking offices.

The idea for combining rail and air travel for holidays originated with V/Line, which sees this as a package that will appeal to many Victorians and overseas tourists wishing to visit interstate capitals.

The General Manager Passenger Services, Len Harper, said V/Line hoped, with this package, to interest a broad range of the holiday market, including international travellers.

He said: 'It is a new market that we will be happy to share in'.

Outlining the thinking behind the creation of combined rail and air holidays, Mr Harper said it was logical and attractive to offer a package that delivered holiday-makers to their destinations in leisurely, relaxed mood, free of tensions of road travel, then enabled them to return home quickly when holiday time was over.

The package, known as The V/Line Rail-Flights, is complete. It includes rail fares, air ticket, accommodation, and meals (where indicated in the detailed brochure available from travel agencies).

The brochure says: 'You'll be able to see more of Australia, take advantage of modern long-distance trains that are world-class in the comfort and facilities they offer, and find plenty to see and do before boarding your TAA flight home.

Holiday-makers have many choices of accommodation included in the package. These have been selected to give travellers tariff options. For example, visitors to Sydney may opt for any of seven hotels or motels.

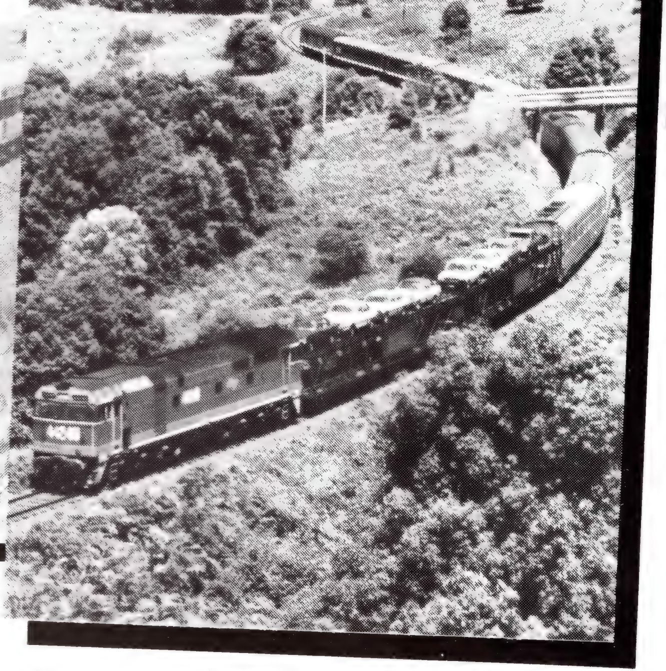
Also, variety has been introduced to the holidays, such as in South Australia where one of the holidays includes five days of cruising the Murray River aboard a modern paddlesteamer.

Full details of what is offering in a widely varied program of holidays, and costs for adults and children, are contained in The V/Line Rail-Flights Holidays brochure at travel agencies. Booking for the holidays may be made with any V/Line travel agent or railway station, or phone V/Line Travel (03) 619 1500.

Want to know more about Australian Railways?

Two "Double Fairlie" locomotives were built in 1879.

Canberra-Sydney XPT in Southern N.S.W.



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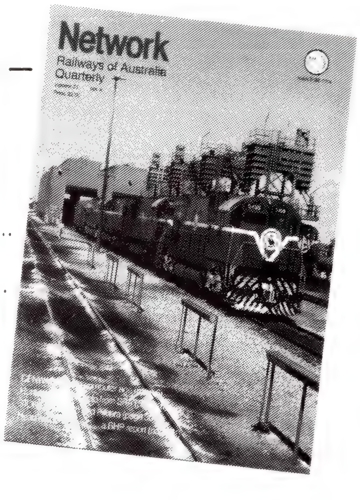

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delivery

NZR get their first new era locomotives

New Zealand Minister of Railways, Mr Richard Prebble has formally accepted the first of the 22 electric locomotives, being built in the UK by Brush Electrical. The locos are destined for use on central section of NZ Railways North Island Main Trunk railway.

Progress on the $NZ200 million-plus electrification work, which involves many major earthmoving and construction projects, is proceeding on schedule towards completion in 1988.

The first of the new locomotives, known as the 30s class, which cost $NZ2.2 million each was handed over to Mr Prebble during a recent visit to the Brush Electrical plant.

The first two locomotives are now on their way to New Zealand - the remaining 20 will be delivered in instalments by mid-1987.

The locomotives will be used primarily to haul freight trains through some of the North Island's most mountainous terrain between Te Rapa, just north of Hamilton and Palmerston North.

Work on the first stage of the electrification, between Palmerston North and Ohakune is virtually completed and construction on the second stage towards Taumaranui is underway.

Similar locomotives, which incorporate regenerative braking and are distinguished by their triple bogie system, are being supplied by Brush Electrical to Queensland Government Railways.

In other recent developments in New Zealand rail, Ross Sayers, until recently New Zealand Breweries managing director, has been appointed to the newly created position of executive chairman to the NZ Railways Corporation.

Murray Smith, who has been chairman since April last year, has agreed to continue to work on Railways' board as deputy chairman - also a newly created position.

The moves were prompted after Mr Smith became general manager of the Development Finance Corporation - the New Zealand government's development bank.

Mr Sayers was appointed a director of Railways' board last year after the resignation of Joe Auton, managing director of Ford in New Zealand until he took up an overseas appointment.

Mr Sayers, 44, is a chartered accountant and chartered secretary, holds a Diploma in Business Administration (Auckland) and has taken an Advanced Management Course at Harvard University.

He has also worked with Feltex New Zealand, Holeproof Industries and in a public accountancy practice.

Meanwhile, the State Railway Authority of NSW is installing the traffic monitoring system (TMS) developed by New Zealand Railways.

The purchase by SRA is the first NZ export order for the software which keeps track of all wagon and locomotive movements throughout a railway network.

The system is marketed by Progeni Systems Ltd in a joint venture with NZR.

As well as the computer software the TMS package includes staff training and implementation programs.

NSW State Rail Authority gave NZR considerable help 10 years ago when NZR began work on their TMS, NZR assistant general manager, Euan McQueen says.

NSW State Rail Authority began development of a wagon control system in the early 1970s but did not proceed with it. The Authority did however provide New Zealand with valuable information on setting up such a scheme.

"We learned a great deal from the Australians' experience which saved us considerable time and money on our system," Mr McQueen says.

rebuild

And refurbishment for Mt. Newman veterans

An innovative rebuild and modernisation of locomotives at Mt Newman Western Australia has given a new lease of life to the 18 year old locos - and capacity to haul bigger tonnages, at less maintenance cost and with significant fuel savings.

The project, by A. Goninan and Co Ltd, of Newcastle New South Wales has been described as "major surgery" to introduce new technology, re-fits of more modern equipment and better working conditions for the crew.

Goninan Chief General Manager, Mr John Fitzgerald, said when the Mt Newman program was completed the company would save 3000 litres of fuel on each round trip from mine to port to mine, as well as allowing it to add 20 extra ore wagons to existing trains.

Mr Fitzgerald said Goninan had worked in conjunction with Mt Newman railway management to analyse and plan a sophisticated engineering specification for the modernisation.

The story began in October 1985 when Mt Newman called tenders for the rebuilding of a batch of their existing Alco locomotives.

During a detailed analysis of the project a more cost effective solution emerged - to engineer a modernisation rather than rebuild to the 1952 standards of the existing locomotive.

The existing Alco engines are to be replaced by new General Electric 16 Cylinder FDL 4000 h.p. units.

The existing Alco/G.E. control systems will be replaced by an up-dated G.E. system, along with a complete rewiring and repiping.

The underframe and bogies will be altered and upgraded to accommodate the new equipment.

A new, modernised cab will provide higher standard of comfort and lower noise levels for the crew.

The modernisation work will be performed by Goninan in Perth, Western Australia.

CHUNNEL AGREEMENT IN PRI

Now that the political decision to link France and Britain has been taken Richard Hope takes a look at the plans for rail and road traffic being firmed up by engineers and operators

It is not year feu vert. There are several hurdles to be jumped before construction of the Channel Tunnel starts in the summer of 1987. Nonetheless, the January 20, 1986 announcement that the Channel Tunnel Group and France-Manche (CTG-FM) have been chosen to build a link takes us forward from the point where the identical scheme for twin rail tunnels with road vehicle ferry trains was cancelled by the British government on January 10, 1975. That, indeed, is progress.

Neither the treaty signed on February 12 nor the concession agreement due to be concluded pose serious problems. It is the hybrid bill presented to the British parliament before Easter that provided a focal point for opposition.

In the year that must pass before this bill receives the Royal assent, the rats of doubt will gnaw at today's political resolve, just as they did in the 1880s and the 1970s. Two British governments have bowed to populist pressures and stopped work on rail tunnels at the engineering design stage — now being entered upon for the third time. Let us hope it will be a case of third time lucky.

The first task for CTG-FM is to create a single organisation to plan and build the tunnel. French and British personnel, many drawn from the civil engineering firms and banks which make up the two groups will work together in a single project office that will either be in Paris or London — the first of many delicate decisions where national pride will have to be swallowed in the interests of efficiency.

Rail will start to play a role from the beginning, as BR and SNCF will be heavily involved in moving the huge volumes of cement, aggregate and steel required. Some of the 6 million m³ of chalk to be excavated may also be removed by rail. There is also the question — as yet unresolved — as to whether the 4.5m diameter service tunnel will have a permanent narrow gauge railway, or whether maintenance personnel will drive through in road vehicles, perhaps with some form of electrical guidance. In any event, substantial quantities of track materials and rolling stock will be required by the tunnelling contractors.

The major decisions for rail investment, however, lie in two separate areas: the shuttle trains that will carry road vehicles between the two terminals, and through passenger and freight trains operated by SNCF and BR.

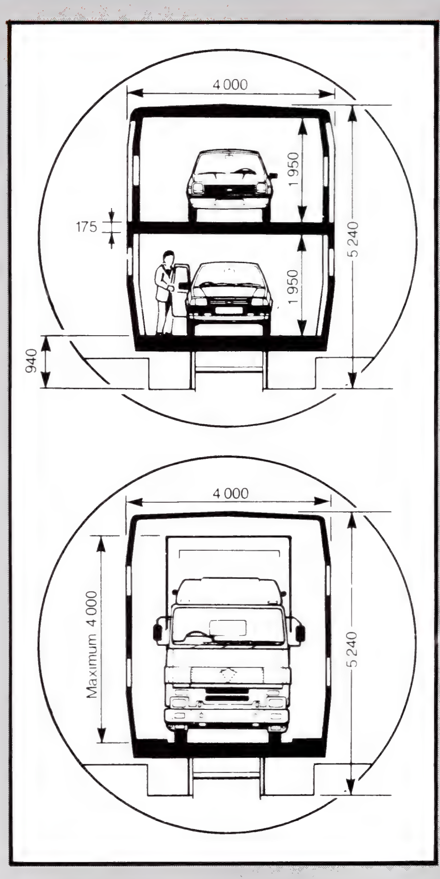
Martin Hemingway, newly appointed as Commercial Director of CTG-FM, not only has the job of producing a shuttle service that works smoothly and with great reliability from the opening day in 1993. He also has to define parameters for the railway through the tunnel that will meet the needs of both road and rail customers.

'We are quite comfortable with our ability to do the job', he insists, 'but there are many technical and operational features which have not yet been optimised'.

One of these is maximum speed. According to Claude Berlioz, head of SNCF's Planning & Economic Research Dept, separate rail tunnels as proposed by EuroRoute and Channel Expressway would have allowed TGVs to transit the tunnel in 15 min less time than will be the case when they have to slow down to fit between the shuttles.

Hemingway denies this. The shuttles will reach a maximum speed of 160 km/h down the 1 per cent grades, and will actually take 25 min to cover the 50 km of track shared with the TGVs. During most of the day — at least in the early years — there will be a passenger (or 'tourist' as CTG-FM calls them) shuttle every 20 min plus a lorry shuttle every 30 min. Only a few peak weekends in high summer will it be necessary to increase these frequencies significantly. If TGVs exploit their much greater power/weight ratio by averaging 150 km/h while still keeping within the limit of 160 km/h, they can transit the tunnel in 20 min.

Given the piston effect in a 6 m bore for through trains only, it is doubtful whether TGVs could have made the passage in less than 15 min. So the penalty of sharing the tunnel with the shuttles is more like 5 min, increasing to 10 min when road traffic peaks.

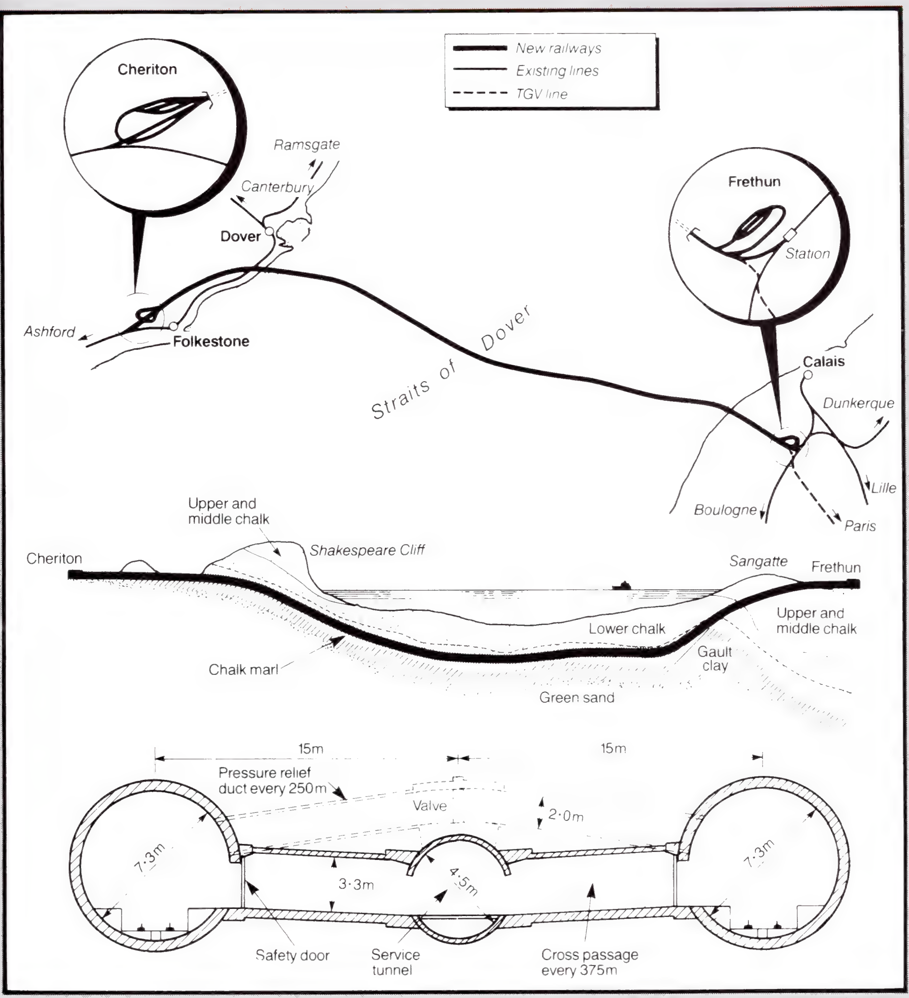


The tunnel alignment has in fact been designed for trains to run at 200 km/h, but CTG-FM intends to install catenary suitable for 160 km/h. 'If the railways are willing to pay the difference', says Hemingway, 'we are quite willing to install 200 km/h catenary'.

The original submission states that the tunnel will be equipped with cab signalling and speed supervision, but that all trains would be manually driven within these constraints.

It now seems likely that full ATO would apply from the start of operations.

Regulating the movement of trains into and through the tunnel will involve complex calculations based on data concerning the location and type of trains approaching on BR and SNCF tracks, and the flow of three different classes of road vehicle through the toll gates. Clearly, this optimisation task is going to be carried out by computers which must be able to regulate train speed directly if they are to be effective. Hemingway confirms that the ultimate capacity target is 30 trains/h in one direction.



Shuttles on demand. There will be three types of shuttle rolling stock, marshalled into tourist and lorry trains.

Nine of each type of train will be required on opening, and both types will have a 4 000 kW electric loco at each end. CTG-FM have stated that they expect to spend Fr330m in France and £28m in Britain on locomotives and Fr940m plus 80m on rolling stock for the shuttles.

Each tourist shuttle will consist of two 350 m rakes of 13 vehicles, one double-deck and one single-deck, with loading wagons at each end of each rake. These vehicles, larger than any passenger-carrying rolling stock ever built, will be 25 m long, 4 m wide and 5·24 m high (Fig 1). Cars will normally use the double-deck rake; caravans, coaches and light goods vehicles will be directed to the single-deck rake. Overall length of a tourist shuttle, with locomotives, is to be 790 m.

Lorry shuttles will be formed of 25 covered wagons to the same external dimensions as regards height and width, but they will only be £18 m long. With loading wagons and locos, overall length of the lorry shuttle will be 540 m, and the maximum hauled load 1 600 tonnes. The lorry shuttle wagons are shorter because each will carry only one vehicle, the maximum permitted length and gross weight of tractor and trailer combinations being 16 m and 44 tonnes.

The terminals at Cheriton and Frethun will consist of a loop leading into 10 loading tracks with platforms on both sides. Double-deck stock will be loaded simultaneously from opposite sides on the two levels. Lorries and coaches will be able to swing right across the loading wagon on to the opposite platform so as to line up before entering the covered wagons. Once loaded, drivers and passengers will have the option of staying in their vehicles or moving about within the train, where they will find toilets and vending machines. Road vehicles will be secured only by their parking brakes, although this policy may have to be modified as regards lorries after trials have been conducted.

The shuttles will not run to a timetable, and there will be no need to book space on a train. Subject to fitting in with timetabled through trains, each type of shuttle will leave either when it is full, or when a predetermined interval has elapsed since the last shuttle of the same type left.

The capacity of the shuttle service on opening will be 1 000 road vehicles an hour. More trains will be ordered as traffic grows, and there is space at the terminals for the loading platforms to be expanded from 10 to 16. The ultimate capacity of the shuttle is about 4 000 vehicles an hour in each direction.

Traffic estimation. The closing weeks of 1985 saw a flurry of negotiations between the fixed link promoters and the two state railways. A major difficulty was the very different approach to infrastructure investment in Paris and London.

SNCF wanted to build a new line from Paris to Brussels via Lille anyway, and considered that a Channel Tunnel would transform a marginal project into a sound economic case — provided everything possible was done to attract business travel by cutting the crucial London-Paris and London-Brussels timings to around 3 h. SNCF and CTG-FM have both accepted a forecast by Setec-Economie that 15.9 million rail passengers will use the tunnel in the first year.

BR and the British government took a more conservative view; for example, it was assumed that fast trains would divert traffic from other modes but not generate new travel. This gave a figure of 11.1 million passengers a year on opening.

The agreement reached by the railways with CTG-FM in December provides for tolls based on the number of passengers and tonnes of freight passing through, with higher volumes attracting lower unit costs. BR's freight forecast for the early years is 6.1 million tonnes, about three times the tonnage presently moving by train, ferry and in railborne containers.

CIPLE . . . NOW THE DETAILS

At Frethun, the connection to the Calais — Boulogne line will face towards Calais, with a station to be built at the junction. SNCF has already announced that 25 kV catenary will be extended 65 km from Hazebrouck to Calais and Frethun. Trains from the tunnel will reach Paris via Arras over lines already electrified at 25 kV.

This connection will be necessary even if — as is anticipated by 1994 — 300 km/h lines are built all the way from the outskirts of Paris and Brussels to Frethun, since freight and loco-hauled passenger trains, such as car-sleepers, would continue to use the existing network. The route of these new lines is still uncertain, as towns such as Amiens lobby to bring it nearer so they can enjoy the benefits of high speed travel.

Not so in Britain, where transport secretary Nicholas Ridley told MPs on January 20: 'It is not planned to increase the standard of the track that runs from Folkestone to London to enable it to take very high speed trains. Such work would cause major disruption and would inflict immense damage on the environment. We have made it clear that that will not happen.

Because BRs plan to create a high speed route to London was largely responsible for cancellation of the last Channel Tunnel project in 1975, extreme caution is being exercised with regard to rail investment on the British side.

Two investment packages have in fact been prepared, but the one that matters assumes that there will be 300 km/h running on the French side. This is tentatively costed at £390m.

Even so, it assumes that no rolling stock which does not conform to the very restrictive BR loading gauge will be allowed beyond the Cheriton terminal, where Hemingway says CTG-FM is willing in principle to accommodate SNCF car-sleeper trains.

Nor is BR willing to contemplate putting up 25 kV catenary over the 110 km between London and Cheriton, as most Southern Region lines are already electrified at 750 V dc third rail.

Current planning provides only for a core network of high speed trains running hourly from London to Paris and Brussels in 3¼ and 3 h, with extra services at peak times, plus some 20 freight trains a day each way.

The TGVs, running at 160 km/h on reduced power from the third rail, will take the present boat train route through Tonbridge, Orpington and Herne Hill to Stewarts Lane where a £14m chord will bring them on to the northernmost pair of the eight tracks leading into Waterloo.

Here a £45m international terminal will be created on the north side of the station with four 400m platforms and facilities for customs and immigration.

This is necessary because the authorities responsible have yet to agree with BR acceptable arrangements for carrying out these formalities on the train.

Andy Heslop, CRs Channel Tunnel Project Director, points out that it will be 'commercially impractical' to run passenger trains to destinations other than London if entry and exit formalities cannot be carried out on the trains, as is the normal practice elsewhere in Western Europe where trains make multiple stops in several countries. 'We still have a dialogue going on this', he says.

Mr Ridley obviously thinks that a change of trains in London will not harm peasants from the provinces, for he told MPs: 'I am anxious that a special arrangement should not be provided for the through trains which use the link which would be competitively disadvantageous for the ferries or for any other forms of transport'.

The only concession currently envisaged is that some TGVs will stop at Ashford to set down or pick up passengers, who will be dealt with as regards frontier formalities at the station; £15m has been allowed for modification of Ashford station.

Core service. Investment in this 'core service' provides for one-third (BRs share) of the cost of 40 TGVs.

Discussions with SNCF and SNCB on the specification for these are at an early stage, but they are assumed for planning purposes to be 400 m long with 770 seats, fully reservable as with the present TGV service out of Gare de Lyon in Paris. They could be accommodated without undue difficulty in the Gare du Nord, where enhanced terminal facilities are planned.

They will certainly have 3 kV dc capability to enter Brussels, and consideration is being given to adding 1.5 kV dc for the Netherlands and/or 15 kV 16⅔ Hz for Germany. If services were extended beyond Brussels, however, more trains would be needed.

The TGVs will be serviced at a new depot costing £42m to be built at North Pole Junction, reached by reinstating a disused spur near Clapham Junction. This will require long overdue electrification of the West London line, which may facilitate the operation of more cross-London suburban and long distance services.

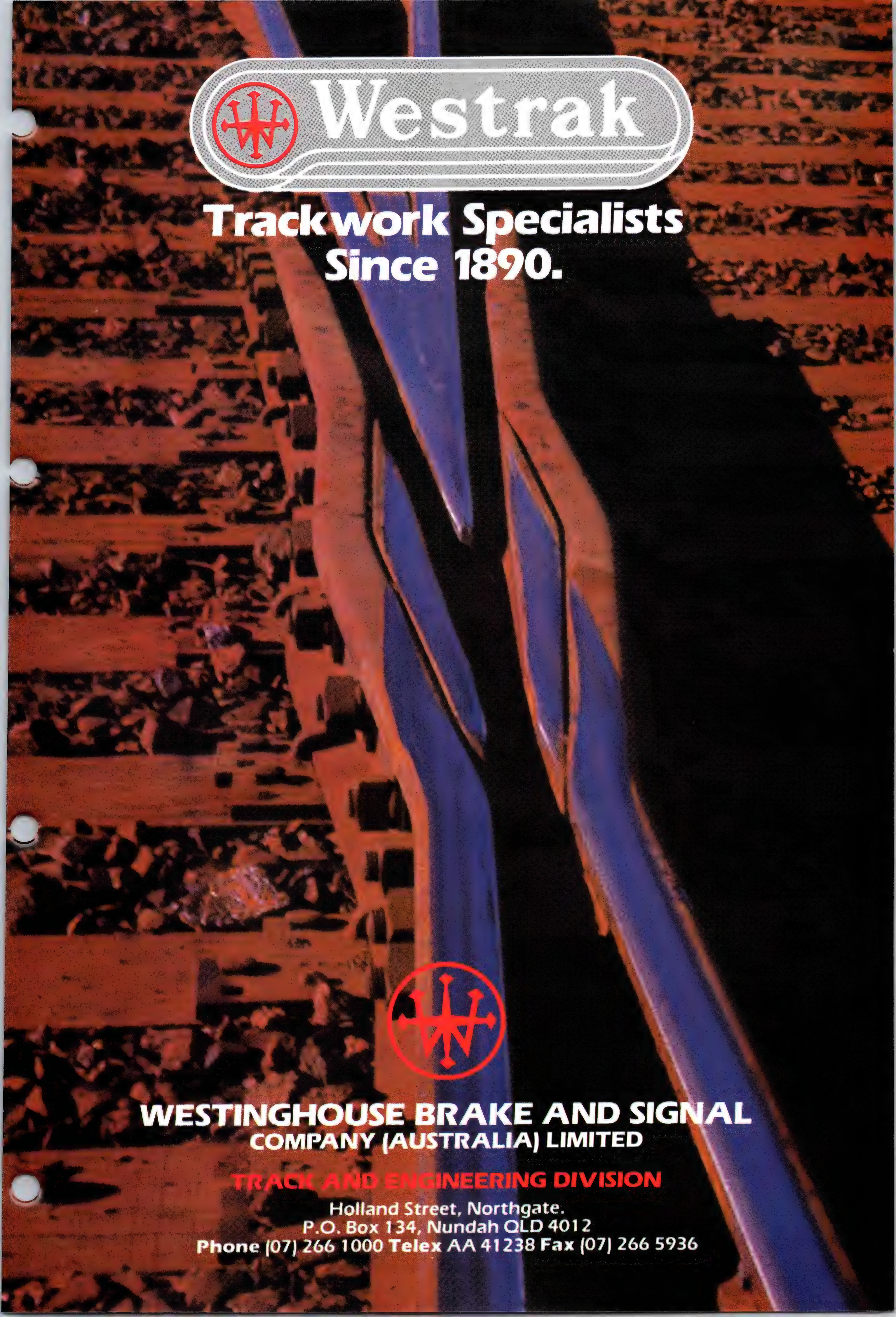
If it eventually proves possible to run through services between provincial cities and the Continent, they will use this route — on which the 1970s Channel Tunnel terminal was to have been sited at White City. In the meantime, the possibility of working trains from the north into Waterloo to give more direct interchange is being considered.

As regards freight, the principal expenditure is 17m on eight reception sidings at Saltwood, where CTG-FM forms a junction with Southern Region.

SNCF electric locomotives will hand over to BR diesels here, while customs check seals and wagons are examined. Most trains will then run via Tonbridge and Redhill (the line is not to be electrified between these points) to Willesden Junction via the West London line. £2m will be spent at Willesden on a terminal where goods can be cleared through customs, but most freight will move on to other destinations.

Notional investment in 44 locos and 380 container wagons has been included in the £205m allowance for rolling stock. The balance of the 390m will go on track improvements to make 160 km/h possible, additional refuge sidings, resignalling reinforcement of the 750 V traction supply.

One thorny question as yet unresolved is the extent to which Southern Region's regular-interval passenger services may have to be adjusted. 'We cannot damage existing Southern Region services', says Heslop, 'so we have to plan round them'. The core service can be fitted into existing boat train paths, except for a 90 min period in the evenings when commuter and international business travel peaks coincide.



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Upgrade for AN's remote location housing

Australian National has undertaken a $5 million housing construction programme designed to improve the living standards of employees in remote locations.

Under the scheme, some 60 new houses and the upgrading of about 35 existing houses, will take place in rail communities across the Trans-Australian railway between now and 1990.

A contract for the first nine of 18 new steel-framed homes to be built at Rawlinna, has already been let.

In Cook 18 new homes will be erected, in Tarcoola (4); Barton (5); Zanthus (6); Forrest (6) and Pimba (4).

Most of the older-style weatherboard houses to be replaced were built during the 1920s.

The new houses will incorporate uniform design features. Each will be built with fire-resistant materials with fire-detection systems installed.

Each will have evaporative air-conditioning systems with concrete floors.

Externally, the houses will have driveways, carports and garages.

Australian National Assistant General Manager (Technical Services), Mr Jim Green, said all construction areas would be upgraded and landscaped to create a "community atmosphere".

"In conjunction with this housing upgrading, we have also established a programme over the next three years for the upgrading of other facilities such as electrical, effluent disposal and roads". he added.

Mr Green said the Rawlinna housing programme would be completed by the end of 1987 with the others being progressively completed by the end of the decade.

"This AN initiative realises the need to provide facilities commensurate with modern day conditions in our outback communities," he added.

Upgrading for remote locations

New road-rail vehicle versatile for recovery

A recovery vehicle that can operate on the road and, when required for an emergency, drive directly onto and along railway tracks... this is the Pathfinder, with four-wheel drive and capable of 100 km/h on the road and 60 km/h on rail.

Able to lift and tow a deadweight of 244 tonnes - such as a derailed diesel locomotive - the vehicle arrives at the trackside, raises itself on an in-built turntable, lowers a pair of railway wheels and drives off. The rail wheels are used for guidance whilst the road wheels provide the traction.

The "go-anywhere" Pathfinder has a crew of six together with jacks, slings, packing, airmats, cutting gear, flood and spot lights, high pressure hydraulic power, compressed air and 110/240V electric power packs. It is manufactured by Bruff Manufacturing Co Ltd of England. Telephone: 08864 333. Telex: 336331.

Fruit harvest depends on rail reliability

Peaches and pears, apples and apricots, after picking and packing in boxes or cans, take a V/Line from the Goulburn Valley.

They go by the pallet load in containers on flat-top freight wagons for the domestic and export markets.

The two big canneries, SPC Ltd and Ardmona Fruit Products Co-operative Co Pty Ltd in the Shepparton - Mooroopna district, and the Northern Pear Growers Ltd (NPG) packers have rail facilities for the despatch of up to thirty containers daily from their respective sidings during the main fruit picking season.

These companies are annually canning or packing nearly 125,000 tonnes of fruit alone.

They are also diversified, particularly the canneries, into more than 200 different product lines and up to 500 line items (sizes and specifications of the product).

They make juices and concentrates as well as other fruit and vegetable products and meals (including soups, spaghetti, curries and beans), sweets and sauces.

V/Line shares in this continued growth, carrying about 4000 containers and 500 vans a year for a revenue approaching $2 million.

The bulk of this tonnage goes to the Swanson and Appleton docks in Melbourne for export to more than 60 countries in Asia, Europe, South-East Asia (Hong Kong, Malaysia), the Middle East, the South Pacific and North America.

The Goulburn Valley fruit growing districts were first developed 100 years ago. The rail line to Shepparton (from Mangalore) was opened in 1880. The first fruit trees on selectors' blocks were planted and commercial production commenced in 1884.

The Shepparton and Mooroopna fruit districts are thriving areas of co-operative enterprise. All fruit growers are share-holders in the canning and packing companies.

At Mooroopna ('Fruit Salad City') for example, Ardmona has a huge canning plant (7 ha) which is almost entirely owned by 350 growers with 1.2 million shares.

SPC and Ardmona are of similar size; both employ about 350 permanent staff with up to 1500 working during the fruit harvest. Each is able to turn out nearly 1000 tonnes of fruit (in cans) every day at that time.

Both companies began their operations in the years following World War I.

Under irrigation, deciduous fruit output had increased to a point where supply far exceeded demand and the Shepparton Irrigators Association decided to preserve its product for export.

The Shepparton Fruit Preserving Company Ltd was formed with State Government financial assistance for the purpose of canning fruit and vegetables, drying or otherwise treating and preparing for market other fruit and vegetables, and manufacturing essences, sauces, lemon juice and other foods.

Nowadays the other foods besides fruit and vegetables include jams, fish, rice and other products.

Ardmona began in 1921, the result of a similar move by growers at Mooroopna. NPG began in 1951 and was likewise accommodated with a rail siding from the outset.

The General Manager of NPG, Mr John Collins, said: 'Rail operations have been steamlined since those days'. Fruit bound for Sydney in louvre vans had to be taken to Seymour, shunted and marshalled for the north-east line and then transferred into different wagons onto the standard gauge at Albury.

Mr Collins said: 'Now with containers and bogie exchange terminals at Melbourne and Wodonga there are substantial savings in transport costs.

'We can get a rake of seven flat-top wagons in at the siding and load fourteen containers for Melbourne before lunch. The fork-lift loading of fruit boxes on pallets has been another vital factor in reducing transport costs.

'The containers are in Melbourne at the docks by the next day.

'Unrefrigerated fruit, especially some varieties of peaches and pears are very volatile, tending to ripen at different rates depending on the weather.

With rail the fruit is 'off power' (i.e. not cooled) and so reliability is all-important in moving the fruit.

The wagons must be there and the schedules strictly maintained. Over the years we have come to rely on rail and our fruit has not got the rot!'

The Shipping and loading liaison manager of SPC, Mr John Parker, said: 'We work hand in hand with V/Line. We usually require about thirteen flat-tops at a time and we load between twenty and thirty containers a day.

'There has to be a certain flexibility of give and take in the fruit production line.

The harvest situation changes from day to day and year to year.

Picking and delivery times vary and the canning, labelling, packaging and warehousing operations are affected accordingly. So is the arrival and departure of rail wagons. V/Line has the flexibility to handle our demands.

'We can't stand still. We have diversified enormously since the 1970s in order to make the most of our labour and capital resources. We try to produce "in season" and then turn to other products when storage is not such a limiting factor in the production schedule.

'On the shipping side, the customer usually nominates the ship and we have to get the fruit on board at a certain time. We usually order the week's wagons from V/Line on a Monday. The Shepparton station-master makes up the rakes and trains. He can normally supply more wagons at short notice if necessary.

The other companies need wagons, too, and we are aware of each other's demands and schedules. Once again we are all flexible and co-operative. The station-master generally gets a complete train every day from the three co-operatives in the Shepparton-Mooroopna region.'

Inside and outside the factories, everyone is dependent on each other from first to last. The fruit needs the pickers and the canneries and packers need the men and women to sort and grade the fruit and watch over the machinery.

Even tea break times are staggered for continuity along the production line.

During the summer a whole cross-section of feminine society goes to work in the Goulburn Valley factories, from girls to grandmothers.

This has been the tradition since the early days.

This interesting photograph from Westrail shows the Indian Pacific crossing the Nullarbor Plain. The unusual effect achieved was created by using a wide angle 'fish-eye' lens.

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New lease of life for V/L

V/Line's foundry at Newport Workshops has been completely renovated in a $3,000,000 program that has transformed the once dark and smoky work area into one of the most modern cast iron foundries in Australia.

The Newport Foundry was constructed in 1928, and even after an upgrade in 1955 was, by today's standards, an extremely difficult working environment.

Its darkness, dinginess, excessive smoke fumes, heavy manual labour, dirt and heat made for a work place not conducive to glossy 'staff wanted' advertisements.

The high labour turnover, and high absenteeism made it a continual struggle to maintain minimum operating staff numbers.

Problems also existed in maintaining the emissions to the atmosphere from the cupola furnaces to the level specified by the Environment Protection Authority.

This scene is now completely in the past as the foundry has been updated with a new melting and automatic moulding system that is the latest thing in electronic operation.

The Newport Foundry plays a vital part in the operation of our railway system. More than 90 per cent of the foundry's activities are involved in the production of brake blocks.

The foundry annually produces more than 300,000 brake blocks which are essential to the running — or rather, stopping — of V/Line trains.

Brake block weights range from 9 to 15 kg each, depending on type. They are composed of solid cast iron.

Despite their solid construction, the enormous forces required to stop a 2000 tonne train travelling at 80 km/h ensure that brake blocks wear out regularly and have to be replaced. For example, the brake blocks on V/Line grain wagons are replaced every six days.

Locomotive brake blocks are replaced even more often, in line with standard safe working and maintenance requirements.

The new equipment that has been installed at the foundry has resulted in more than a cleaner work environment. The foundry can now cope easily with the demands of V/Line for brake blocks. In fact, faster production and higher cost-benefit ratios mean that, in the future, the foundry will be expanding its markets.

As Denis Smith, Group Manager Engineering Workshops Division, puts it: 'The objectives are to enter the commercial area and manufacture and sell brake blocks to other railway systems, and general miscellaneous cast iron products for industry. We now have one of the technically most modern foundries in Australia for cast iron production and we can produce a better and significantly cheaper product than our competitors.

'We hope for a 20 per cent to 40 per cent cost reduction a brake block produced, using the newly installed equipment. This can be achieved through mass production methods combined with the fact that the new furnaces will operated using scrap steel that is available from within the rail system'.

Formerly, the old Newport furnaces had to use pig-iron and coke which had to be bought from external suppliers. Most rail materials for brake block construction are now available from internal sources.

Two new Pillar furnaces, constructed in Australia by Douglas Industrial Furnaces, have been installed at a cost of $520,000. These electronically controlled units can melt down two tonnes of scrap iron in fifty-five minutes.

They are 1300 kW electric induction furnaces with ceramic refractory walls. The furnaces function through the process of induction. The furnace cradles are wound around with large copper coils that heat in a similar way to a domestic electric jug element.

The furnaces have been installed on a raised platform, upon which the operator also stands. In this way there is less possibility of spillage.

Once the scrap metal has been melted, the hydraulically operated furnace cradles tilt the whole mechanism, discharging it into ladles placed on the work floor. The ladles are then picked up by overhead crane and transferred to a DISA moulding machine where the molten metal is poured into brake block moulds.

The DISA moulding equipment is a completely new installation, supplied by Anitech at a cost of $1.6 million. Moulding sand, mixed with additives and water, passes into the machine via a series of conveyor belts and storage hoppers. The sand is pressed into an upright mould shape at the rat of 140 moulds an hour. The moulds come out the far side of the DISA like a gigantic sausage chain and are manually filled with molten metal from the ladles.

The completed brake blocks, still encased in moulds, pass along a second conveyor belt and one hour after pouring, when the molten metal has solidified, the mould is broken and the sand separated from the brake block.

boost

e's Newport Workshops

Left to cool overnight, the brake blocks are cleaned using a shot blasting process, inspected and stored before despatch to the customer.

The automated nature of the new equipment means that acceptable tolerances in the finished product are easier to achieve. Reject rates have dropped to about 1 per cent using the new foundry equipment.

Using the old equipment, 54 staff were required to produce 15 tonnes of brake blocks a day. Now 20 tonnes can be produced using only 27 staff. The excess staff has been relocated to other areas of Newport Workshops.

As well as the foundry equipment, staff working conditions have been improved. The foundry building has been reclad and provides significant natural light and an office and staff amenities block complete with showers, meal room, locker room and air-conditioning.

The overall effect of these changes has been more than increased production. The jobs that in the past were time consuming and labour intensive, have been automated.

This has resulted in better job satisfaction, greater on-the-job safety and a cleaner work environment. Back strains and injuries resulting from heavy lifting have been virtually eliminated.

As V/Line moves into a future dominated by market-oriented thinking patterns, the Workshops Division is pursuing a significant opportunity to demonstrate that it, too, can function effectively and profitably in a commercial environment.

A once dark and smoky work area is now transformed with the foundry renovations

Steel sleepers. Making

Redesigned from first principles, sleepers made from BHP steel are an economic alternative to timber and concrete. Some of the advantages of steel sleepers are:

Cost.
Steel is competitive with timber and concrete on a first cost basis and also offers cost advantages on an installed cost basis.

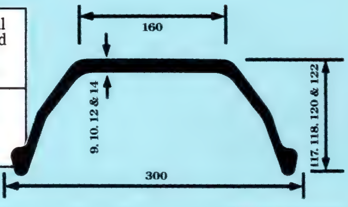
Lower Track Installation Costs.
Steel sleepers with improved fastening such as Wilclip Traklok 1 and Pandrol are lighter and have fewer components. This is particularly relevant in reducing track laying time. A gang which can lay 200 timber sleepers a day could well lay 500-600 steel sleepers a day.

Therefore, use of track possession time can be maximised on heavily trafficked routes.

Sleeper profiles and indicative applications

Heavy Haul

	Mass kg/m	Web thickness mm	Nominal axle load tonnes
W14	40.1	14	60
W12	35.3	12	60
W10	30.5	10	50
W9	28.2	9	35



Another significant advantage is that no sophisticated track laying machinery is required as is the case for concrete sleepers.

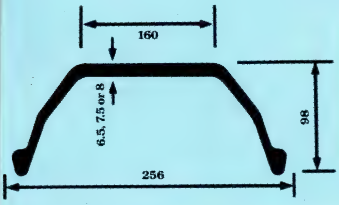
Freight And Handling Costs.
Track construction is very much a materials handling exercise. On a large track laying project, steel sleepers rather than concrete can yield massive savings in

tracks for the future.

traffic costs. Ask your commercial and marketing people what this costs in terms of commitment of wagons and locomotives.

In addition to this, the light weight of steel sleepers reduces handling charges.

N.B.: Sleeper spacing depends upon gauge, axle loads and operating conditions.



Mainline

	Mass	Web thickness	Nominal axle load
	kg/m	mm	tonnes
M8	21.5	8.0	25
M7.5	20.3	7.5	25
M6.5	19.2	6.5	25

All dimensions in mm

Lower Track Maintenance Costs.

With simple 'fit-and-forget' fastenings, steel sleepers return significant savings and keep consistent gauge.

Steel sleepers have the added advantage on un-signalled track where insulation pads can be omitted.

This yields cost savings in comparison to sleepers made from alternative materials which require sleeper plates or pads to absorb impact loading which, if omitted, would lead to sleeper failure.

Meridian/BHL 1188

Insulation.

The BHP insulation system provides over 20,000 ohms of resistance between rail seats.

Long Life.

The durability of steel sleepers adds decades to design life.

Make the decision that will last into the future – specify sleepers made from BHP steel.

BHP Steel
International Group

Long Products Division

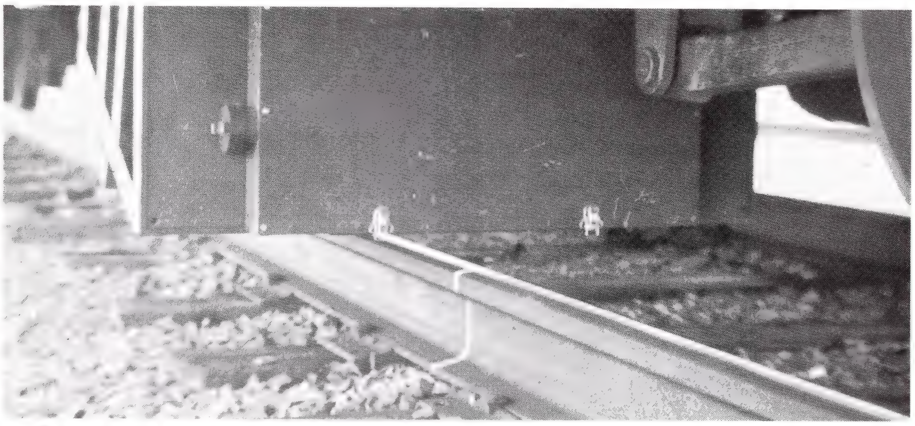
Victoria Mr. Julius Matthys Toll Free (008) 13 6117 South Australia Mr. Ted Lojszczyk (08) 212 6700 Western Australia Mr. Ian Metcalfe (09) 325 9633

Train mounted video measures rail profile at speed

Accurate recording of railhead profiles has traditionally been undertaken using feelers or probe sensors to locate and measure any wear. This restricts the measuring vehicle to a comparatively slow speed during test runs and limits the amount of recording which a single car can undertake. To permit high speed recording, Hamersley Iron Railway and Conrail have opted for a contact-free system of profile measurement involving photogrammetry.

Non-contact system devised by CSIRO

The Liteslice measuring technique was devised by CSIRO and developed by Aldetec specifically for Australia's heavy haul lines; it is now being marketed by Ultrasound International, a joint venture of Adetec's parent Futuris Corp and Tamper Australia.



LITESLICE unit mounted beneath rail vehicle.

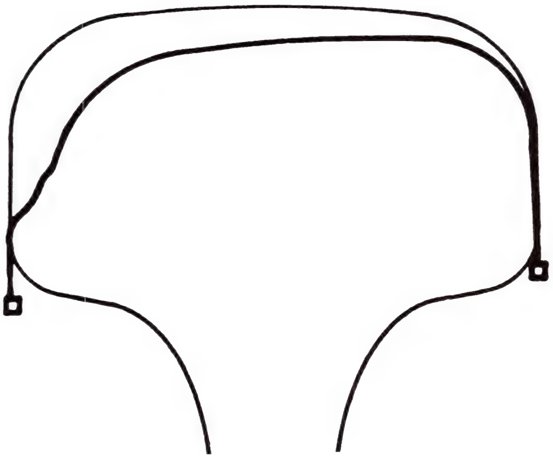
Underslung cameras

At the heart of the Liteslice system are two optical recording assemblies which are mounted below the recording car. Each incorporates a high powered flashlight and a pair of solid state television cameras which are focused on to one rail, giving a complete view all round the railhead.
The light source illuminates a narrow band across the railhead whilst mirrors at both ends of the assembly reflect light on to the underside of the head and the web of the rail (above).
The output signal from each camera is processed by its own minicomputer to remove extraneous images and digitise the resultant profile. The two profiles are corrected for camera geometry and are then combined to give a single composite cross-section, which is transferred to the central processor.
The cameras record the rail profiles at 0.2 s intervals, giving a mean spacing between profiles of 5m at 80 km/h. To allow for dynamic movement of the vehicle or curvature of the track, a pattern recognition system has been built into the unit to ensure that the rails remain in the camera's field of view. Signal enhancement techniques are used to overcome ambient light levels and other potential error sources, and to ensure the resulting images are suitable for processing by the bank of seven DEC LSI-11/73 computers which are mounted in the recording car. The optical equipment is completely independent of the speed and direction of the vehicle.
Recording runs can be undertaken at speeds of up to 80 km/h, allowing the test car to analyse any section of line between scheduled trains.
The basic data prepared by the processors includes the measured profile, the head area of each profile, and a printed listing of sites where railhead wear exceeds preset tolerance limits. All this data is recorded on magnetic tape for transfer to a central computer for further analysis or to prepare rail rectification programmes. The data from a series of tests can be used to observe the gradual deterioration of the railhead, enabling rail replacement programmes to be established well in advance.
Calibration of the equipment is achieved with a special target on to which the cameras are focused. A built-in computer programme converts the results and establishes calibration constants which can be used during operating runs.

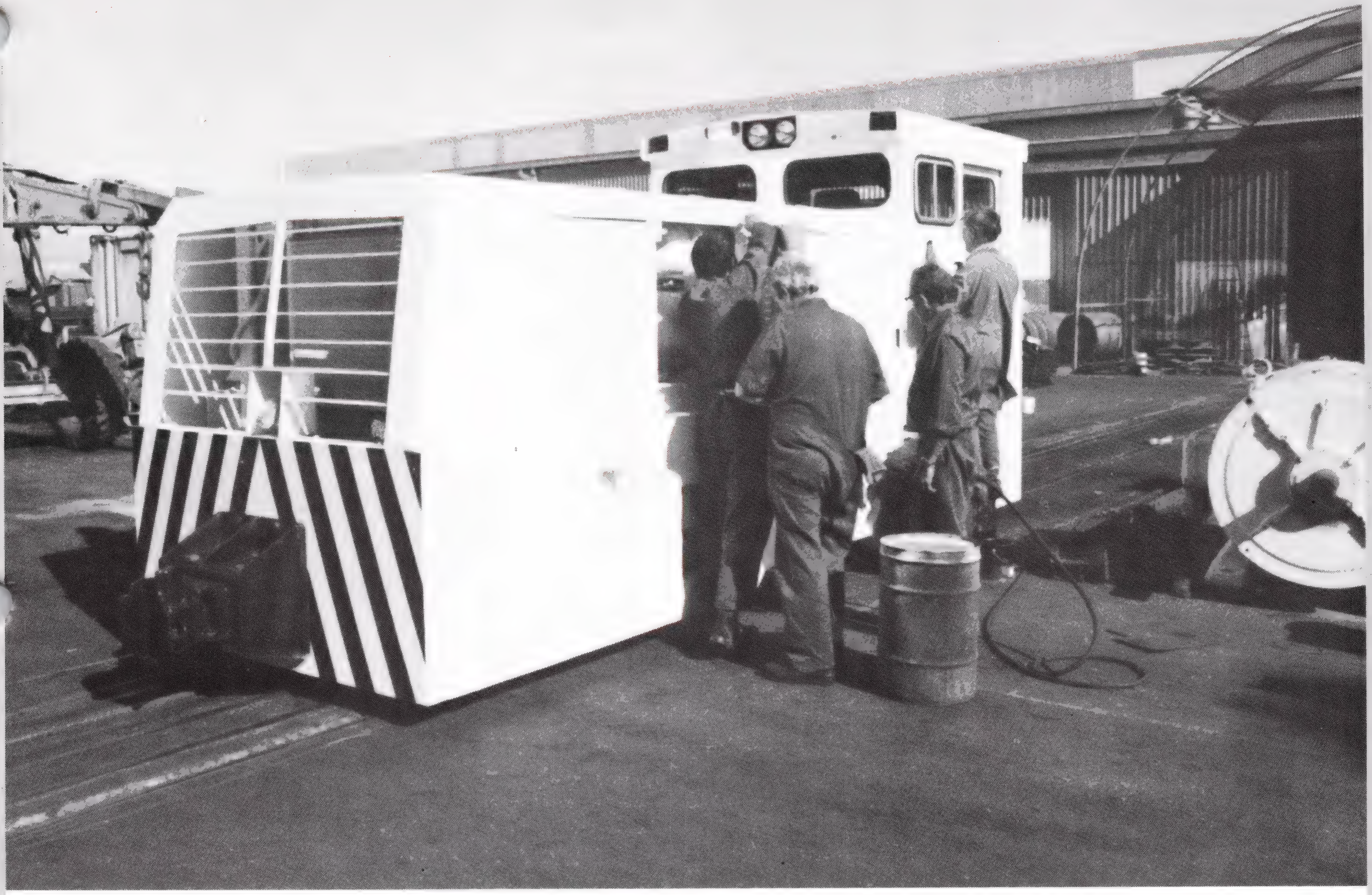
Liteslice - the Rail Profile

The profile at each measurement is also stored on magnetic tape; a print-out of the profile can be obtained where desired. This can be performed at the time of recording or discovered at a later analysis stage.

This information is constantly available to the operator on television monitors at the operating console.



Plotted profiles against original rail section.



The finishing touches being made to the first locomotive produced for Tasmanian HEC by WA Engineer, George Moss Ltd.

West Australian locos for Tasmanian Hydro tunnel

The first of a five special purpose locomotives has left Perth on the road and sea journey to Tasmania.

They are being built by leading West Australian engineering company, George Moss Ltd under a $1 million contract awarded by the Hydro Electricity Commission.

They are to be used to remove spoil from the Commission's seven kilometre-long tunnel system at Crotty, near Queenstown on the west coast of Tasmania.

The 25-tonne locomotives, powered by 300 hp pre-combustion type turbo-charged diesel engines, have been designed and built by George Moss Ltd at the company's Osborne Park factory.

They are the first hydrostatic diesel hydraulic models even produced for mining or tunnelling operations in Australia.

Managing Director of George Moss Ltd, Mr. Frank Quilty said until now hydrostatic system, the engine powers variable displacement hydraulic pumps which provide high-pressure oil to variable displacement drive motors on the axle-hung transmission units.

"The benefit of this design is its fool-proof operation. The driver only has two controls - a forward/reverse selector, and an engine throttle - he need only select the required rpm and the hydraulic system itself selects the correct speed ratios for the transmission based on load and gradient," he said.

Another unusual feature of the locomotive is the automatically applied engine braking system incorporated into a throttle control - a feature not available through hydrodynamic transmission systems.

The braking system itself is pneumatic and has independent fail-safe actuators on each of the wheels.

As operations of the locomotive are mainly underground, the George Moss factory has equipped these models with stainless steel exhaust water scrubbers which, combined with a pre-combustion system ensures that all exhaust emissions are well below that prescribed by the Mines Department authorities.

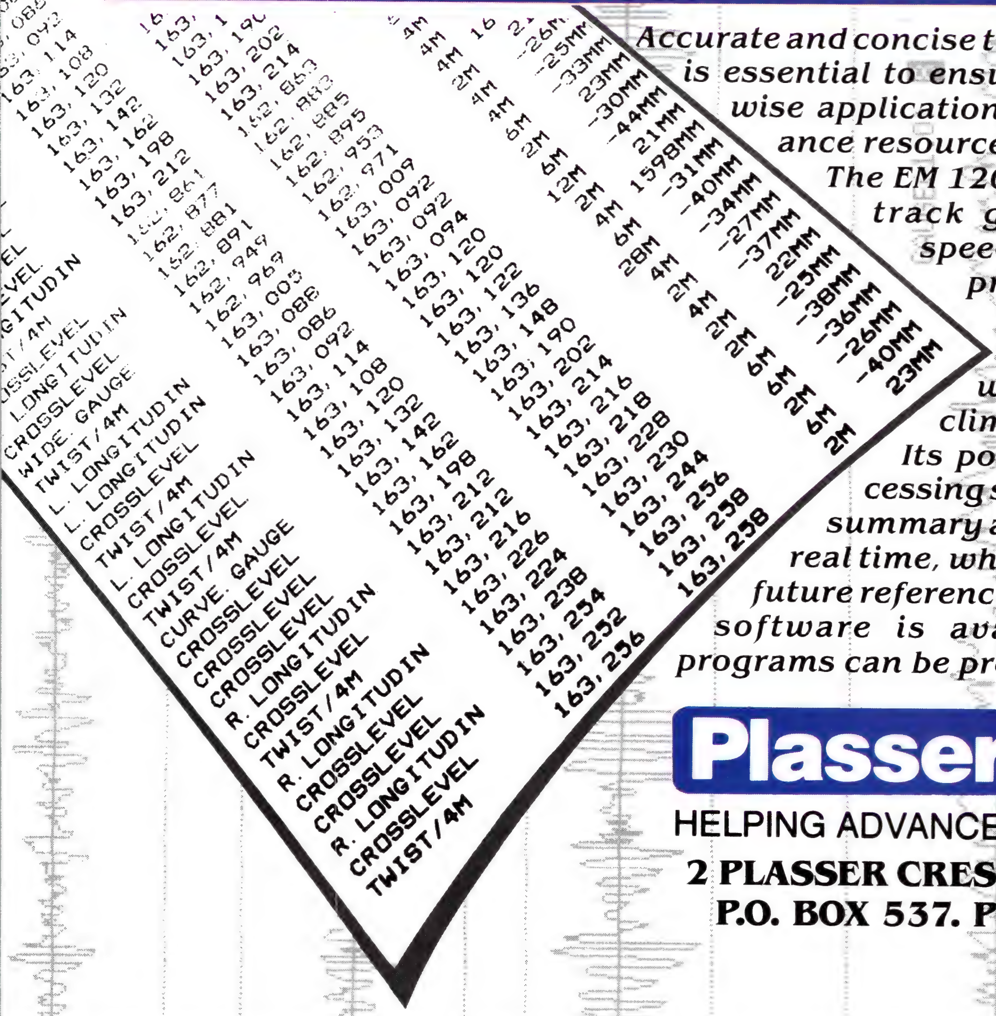
Comfort of the locomotive driver has not been neglected and Bostrum-style ergonomic seating has been installed to cushion the operator against any effect of sudden movement.

The cabin is fully insulated against excessive noise and cold. Twin heater/demister units have also been fitted to cater for the low temperatures experienced at the Crotty tunnelling project.

The locomotives will be hauling 300 tonne loads incorporating 200 tonnes of tunnel rock spoil in 12 side - tipping Granby trucks. Full-load operating speed is 20 km/h.

Delivery of the locomotives will be at two-weekly intervals over the next couple of months.

The supplier will send re-presentatives to Tasmania to commission for operation and conduct a maintenance training programme for Hydro Electricity Commission staff.



EM 120, setting the standard in track recording methods.

Accurate and concise track geometry information is essential to ensure operational safety and wise application of limited track maintenance resources.

The EM 120 measures and records all track geometry parameters at speeds of up to 120 km/hr. Its proven and highly refined measuring system ensures repeatability under widely varying track and climatic conditions.

Its powerful on-board data processing system produces exception, summary and track quality reports in real time, whilst storing all raw data for future reference. A wide range of standard software is available and specialised programs can be prepared if required.

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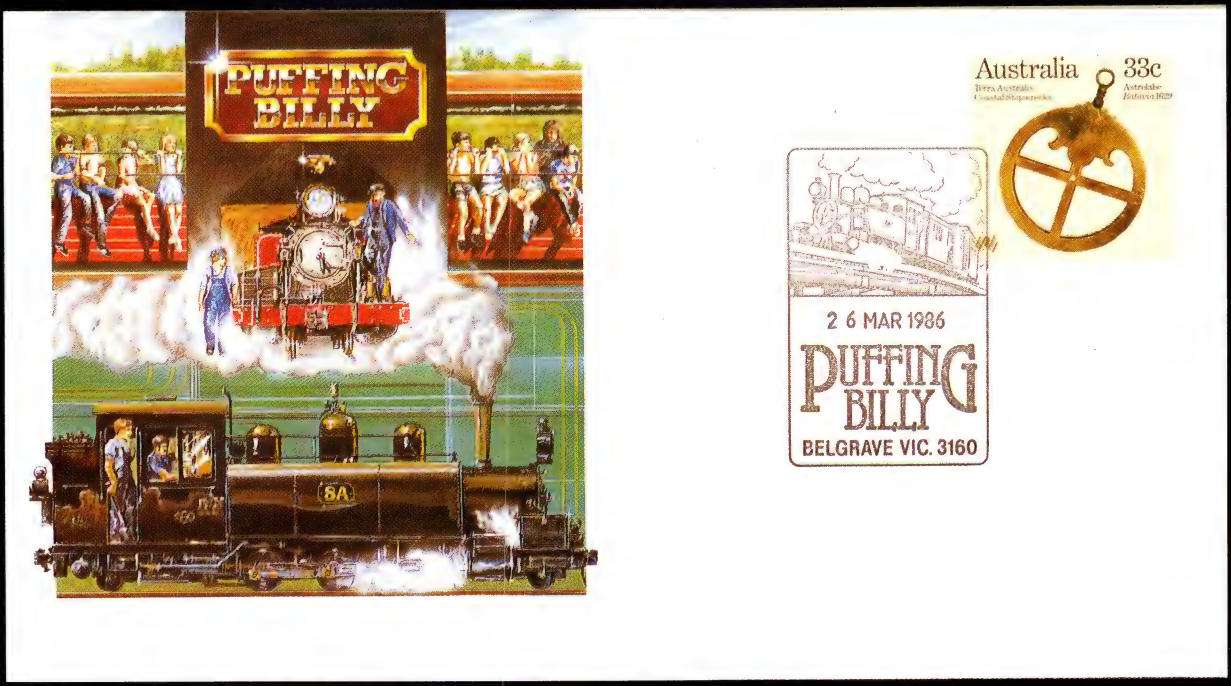


Australia Post honours Puffing Billy

MANUFACTURED AT THE VR 1914 NEWPORT WORKSHOPS

Aboard the Puffing Billy locomotive cab to launch the souvenir cover are (left to right): Fireman Stephen Strangward, Driver Ron Picking, and Belgrave Postmaster Alan Burton.

Australia Post hopped aboard Puffing Billy Railway to launch the souvenir cover for the famous steam train. Passengers were delighted to receive a souvenir cover before the train started on it's journey.

The turn of the century railway which was very important to settlement in Victoria has captured modern day hearts.

Nestled in the Dandenong Ranges, the train meanders through the beautiful countryside of ferns and rain forests to the town of Lakeside, where passengers stop for a few hours for a swim or bushwalk before the train returns to Belgrave.

Puffing Billy has survived over the years despite enormous difficulties including the high cost of maintenance which has partially been overcome by use of volunteer staff.

Volunteers act as guards, stationmasters, mechanical engineers, and signalmen when they report for duty.

This hobby brings to life their childhood dream of running a real train!

The souvenir cover designed by Mark Todd, Australia Post Graphic Design Studio, Victoria, is a montage of scenes including children enjoying their train ride, the train running at full steam, and the driver and fireman inspecting the train before the journey.

Passenger revival picks-up in South Australia

2

A revival in passenger rail travel among South Australians has led to a revitalised rail service to Mt Gambier in the State's south-east and re-introduction of passenger services to Whyalla in the Spencer Gulf.

Such developments would not have seemed possible just 12 months ago.

At that stage, Australian National's passenger figures on its Mr Gambier service seemd to indicate an irreversable decline in patronage.

The possibility of a Whyalla/Adelaide service was remote.

In October '85, a revised passenger service between Adelaide and Mt Gambier was launched.

Called the 'Blue Lake', it was introduced as a positive measure to increase patronage and reduce the operating costs being incurred on the line.

The service involved several innovations which included

- introduction of faster weekend services from Adelaide and Mt Gambier departing at 4.30 pm on Fridays and Sundays, arriving at Mt Gambier and Adelaide at 11.05 pm and 11.30 pm respectively.
- a reduction of 30 per cent in the adult fare from $30 single to $21 for a trial period.
- refreshment services including packaged hot meals, light snacks and beverages.

At the time AN said the announced changes would result in some economies but the future success of the service would depend on the support of the people of the south-east.

By April this year a major success story was reported in Australian National's monthly house journal, 'AN news.'

It said that in just over six months, AN had "arrested" the downward trend in passenger figures and increased patronage on the 'Blue Lake' by 15 per cent compared to a corresponding period in 1984/'85.

If recognition had been given to the downward trend which previously existed, the increase in patronage was in excess of 30 per cent.

By the end of AN's 1985/'86 financial period, well over 20,000 passengers will have utilised the new 'Blue Lake'.

Their support has vindicated AN's decision to rationalise its passenger services between the two centres.

Other initiatives such as the reduced fare, a faster service, and implementing promotional and publicity activities to support its existence also contributed.

As many rail authorities would agree, arresting a downward trend is very difficult.

1. Interior of 'The Iron Triangle'
2. 'The Iron Triangle Limited'
3. AN General Manager, Dr Don Williams, addresses guests after the arrival of the inaugural Budd car service from Whyalla
4. The 'Blue Lake'

However the complete reversal of that trend has been achieved with the 'Blue Lake'.

As far as the service to Whyalla is concerned, Australian National launched the 'Iron Triangle Limited' between the two centres in April this year.

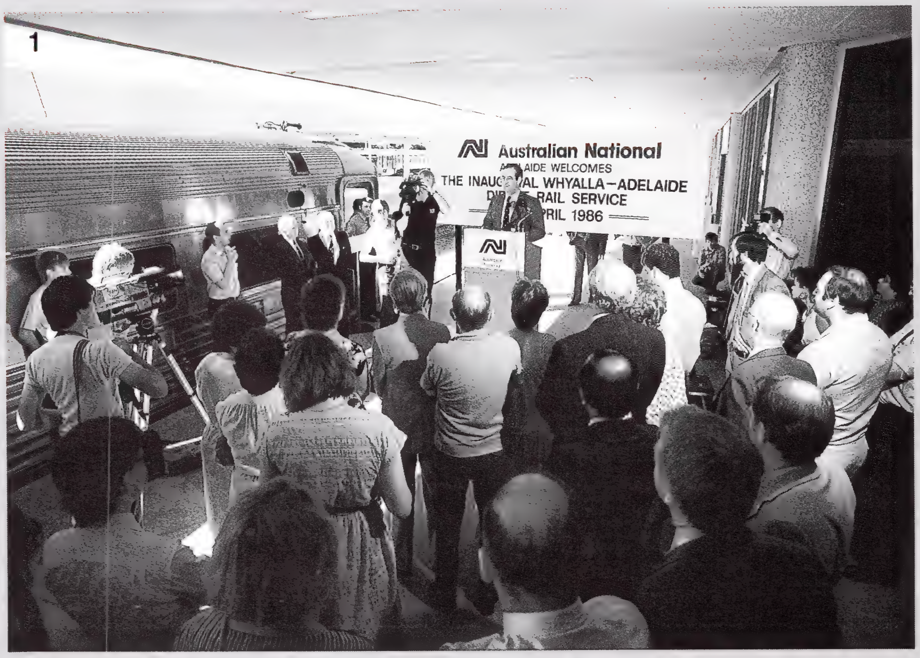
It arose out of an idea to utilise a former Commonwealth Railways Budd car which had been unused since the early 1970s.

Back in 1950, the Commonwealth Railways let a contract to the Budd Company of the USA for the delivery of three air-conditioned Budd railcars.

The Commonwealth Railways had planned to use the vehicles on services between Port Pirie, Port Augusta and Tarcoola.

The first Budd railcar tests ran on the Pennsylvania Railroad in September 1949, and were a instant success.

Tests proved the cars could attain 100km/h within two minutes and 120km/h in four minutes.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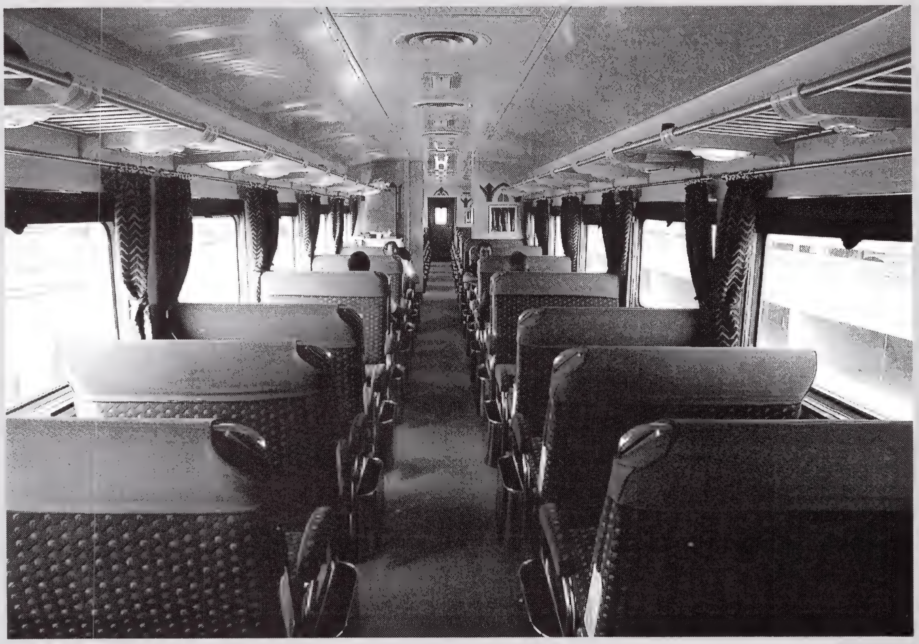

4

The three CR cars arrived on March 1951 and were delivered as an 'off the shelf' American-designed high speed air-conditioned stainless steel railcar.

In late 1951, a trial run of a Budd car from Port Augusta to Kalgoorlie achieved excellent results.

The total time elapsed, including 35 stops for the 1700km journey was only 18 hours and 40 minutes. Discounting the stops the overall average running speed was 105km/h.

A maximum speed of 145km/h was attained on the famous straight across the Nullarbor.

When introduced into regular service the cars often ran at 120km/h.

The cars made hundreds of trips to Woomera, and to Marree when the new standard gauge line reached there in the 1950s.

During the mid-1960s, new Rolls Royce engines were purchased to replace the original Detroit diesel engines.

With the opening of the Port Augusta to Whyalla standard gauge line in 1972, the Budd cars gained a new lease of life.

They were used extensively on the original 'ill-fated service which was closed in 1976 due to roaming livestock on the line, unreliability and declining patronage.'

After the closure of the Woomera passenger service, the Budd cars were then placed in mothballs.

A revived passenger services outlook after much detailed investigation and surveys, has resulted in a new Whyalla passenger service.

Complete upgrading and refurbishing of the Budd cars has given AN the necessary 'tools' to attract customers from the large cities of Whyalla, Port Augusta and Port Pirie.

The 'Iron Triangle Limited' Budd car is the only one of its type still running on a regular basis in the world.

The Queenslander

The 'Classic' Traveltrain adventure

The Queenslander is a luxury passenger Traveltrain service following the beautiful Sunshine Route along Queensland's scenic coast between Brisbane and Cairns.

Passengers will experience the unique adventure of train travel set in an everchanging backdrop of modern cities, tranquil rural landscapes, quiet coastal retreats and lush tropical rainforest. In the classic mould of some of the world's great trains, The Queenslander will provide excellent facilities totally devoted to first class passenger comfort and indulgence . . . an elegant restaurant, and exclusive first class Lounge Car, comfortable personal sleeping compartments and Sitting Cars.

Dine in elegance!

The Queenslander passengers will be treated to exotic Queensland delicacies served in the elegant restaurant which features large panoramic windows. For first class passengers these meals are all inclusive in the fare.

Your motel on wheels

First class passengers will be treated to private, air-conditioned compartments which boast wardrobes, hot and cold water, and colour co-ordinated blankets, towels and linen. First class roomettes include a private toilet.

Lounge in classical style

First class passengers may wish to relax in The Queenslander's exclusive Lounge Car. Genuine Queensland timber panelling, plush furniture, brass fittings, a TV monitor and lush tropical plants make this an excellent place to relax, or sip a long cool drink with fellow travellers.

Take your car-easy

For ultimate convenience, an onboard MotorRail service will be available for passengers' vehicles. This will provide passengers between Cairns, Townsville and Brisbane with the opportunity to take their own car with them — easy! The Queenslander will travel weekly between Brisbane/Cairns and return. Economy class facilities will also be available.

Book now! Phone Queensland Railways:
Brisbane (07) 225 1122; Cairns (070) 51 1218;
Townsville (077) 72 8305.
Or contact your local Station Master.

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TRAIN MOVIES . . .

lights . . .

Dear Mr Producer,
Re your next train movie: Yes, that trains - especially people trains - are the stuff of a successful photoplay. Trains go through splendid scenery, and are themselves photogenic. They are visually more interesting than mass-produced motor cars and all those standard Boeings daubed in Global Trans-Intercontinental paint schemes (port side - only paint job, quickly please chaps, renting jets costs kilobucks). Trains carry a wider spectrum of society, making for a greater contrast in people. They provide more space for nice bars and gracious dinner-table settings. Their sleeping cars can be slightly naughty. Trains are also big, and big is beautiful on the Big Screen. They link different settings and situations; they are settings in themselves.

At this point, Mr Producer, our industry and some of yours begin to part company. Because in making movies, your industry tends to be scrupulous to get the automobiles and Ten-Four police radio procedures that most of us reckon we understand by now exactly right. You are also to be fairly circumspect in presenting air transport (doubtful companies and unsafe planes excepted). In an industry where most of us are conditioned to accept that if anything significant goes wrong (or is encouraged to), it's lights-up and the National Anthem. But in respect of our industry, too many of you chaps cut rather fast and loose. Here, then, is a short Producer's Primer for Cinema Credibility on the rails.

Hijacks

Violence seems to be the theme of much of today's dramatic entertainment, here are some practical notes on hijacking trains.

Few vehicles are harder to hijack than a train, although some Moluccan terrorists did so in Holland a few years back. Specifically, no vehicle on the move is harder to hijack than a train, and once hijacked, to keep running against the wishes of any single person on the train. No vehicle is a riskier proposition to divert to a place of the hijacker's choice, against the collective planning wisdom, communications, and other resources of the railway administration, plus the Railway and the local police. The more

powerful organs of an angry Government - ranging from Cabinets to the Special Air Service, can cope with trains easier than most vehicles.
On terrorism, which some rational people think that your television colleagues have encouraged — yes, it is true that anti-social elements have exploded bombs on trains to kill and injure people. To the best of our knowledge, they've yet to derail or wreck the train itself by this means. Trains are harder to blow up and burn than aeroplanes, and cannot divert to Benghazi. It is very hard to guarantee the demise of a particular passenger by wrecking his train.
A fast-moving train may appear to be a near-irresistible object - which it is, should you encounter it at a level crossing. But in fact, it is relatively easy for lineside marksmen to stop a train with no risk of injury to those inside. Or, if the authorities are given time, even to stop, it (as a last resort) by a controlled derailment at a chosen safe location. The construction of modern trains is such that this procedure can maximise the time taken to bring the cars to rest on the ground, minimise the impact forces, and avoid the risk of significant passenger injury. We don't intend to indicate how - but it can be done.
So the fact is, Mr Producer, trains make lousy hijack targets. The only credible train-hijack movies we've seen have involved subway trains, namely - **The French Connection** and **The Taking of Pelham 123** in both of which, you'll recall, the signal system caught the runaway train before minimal (if indeed any) damage was done to property and people. Gunshot victims, of course, are expendable.

De-railment

Although many trains have been wilfully derailed down through the years, the fact remains that situations of insurgency excepted a great many more trains and their drivers have stubbornly refused to become derailed, in spite of the saboteur's endeavours. This is because tracks are a lot harder to sabotage, and trains to derail by obstruction, than most people think.
Again, we are not about to tell you how to do these things, because invariably, some antisocial idiot who reads this memo or sees your movie will be tempted to try it. We'll merely point out that nowadays, rails are long-welded and insulation joints glued (so you can't unbolt the fishplates). If you do manage to cut through a rail on a busy line, the odds today are that it'll be in track-circuited territory. Opening the rails promptly puts the signals to red, stopping traffic and alerting the control office to a problem. There's nothing the saboteur can do about this, because the system's expressly intended to cope.
End of movie. An alternative is to sneak into the booking office and tear up all the tickets.

Signal Systems

Signal systems are designed to fail safe, ie. to show red lights when things are not right. That includes tampering with equipment and cutting wires. This irritates people by stopping trains, but rarely wrecks them. Except in the movies, it takes a very, very expert saboteur to stage an accident by tampering with a modern signal system. Incidentally, no light always counts as a red light.
Would you please note, Mr Producer, that railways don't rely solely upon computers to protect their trains? All the central computer can do - where there is one - is to ask (via telemetry to a remote on-ground "location") the local part of the signal system to consider doing something, like setting up a route for clearing a signal. Only if it's safe to do this (ie. no other train is in section, the points are set, locked and proven right, no other conflicting route has been set up, in other words everything has been checked and double-checked A-OK), will the ground equipment respond positively to the computer's request. If the request is in any way dangerous, the system will reject it. Everytime, too.

The reason that central computers aren't used for direct control of vital safety functions is that like you, railway signal engineers have had their credit card and telephone accounts loused up by computers, including idiots who program and feed them. So the signal engineers rely on what's called hard-wired, fail-safe, signal equipment in the field for all vital safety functions. All that our computers have done is to overlay a superior traffic-regulation function over the previously-existing safe systems.

In fact, Mr Producer, only now are railways starting to experiment with minicomputers for vital signalling and interlocking. Arranged on double and triple redundancy principles (like the BAC One-Eleven Autoland equipment) the long-term intention is to replace the proven hard-wired safety system in the field with cheaper equipment that's easier to maintain.

On control centres, always great scenes for centralised drama, we accept that our typical Centralised Traffic Control panel being many metres long, doesn't comfortably fit into the shape of a four by three screen. Or even onto a cinemascope screen.

Also that our colour VDU alternatives are just another TV set, and look rather tame when your A.S.C. photographs them. That doesn't give you the right to install your own panels, and pretend they're like ours - especially if the railroad tracks resemble Johnny's Triang train set, and other mysterious machines (second hand from Dr Who) whirr, flash and ring bells in the corner.

Finally, if your story requires an evil mastermind of some kind to reprogram a railway signalling computer for some nefarious purpose, your scriptwriter must figure a means to assure the prior corruption of the railway's Chief Signal and Telecommunications Engineer, all members of the Signal Branch, all the contractors, and all the consultants involved in implementing a complete re-equipment programme along fundamentally unsafe lines. A programme that would have taken the previous 10 years to implement. Sorry about that.

GETTING IT RIGHT

Credibility

What you put into your screenplay, Sir, is your business. But when you weave our industry into its thread, we suggest that you stay within your bounds of credibility.

We think today's audiences are better-educated, better-travelled and — yes a damn sight better-informed than some of your colleagues would have you believe. So please try to be credible in an incredulous world.

For example, if some horrible plague breaks out on a train in Switzerland, and your scriptwriter somehow persuades the comrades to import it by diverting the train east, kindly consider the thousands of Eurailpass users. They know exactly what SNCF means when they see the engine. They're also aware that France is due west, and not east, of Switzerland. By the way, to get from Switzerland east to Poland you've also got to go through Germany (or Austria) and Czechoslovakia.

When you pick a bridge, we'd not suggest Gustav Eiffel's famous Garabit viaduct at Fades. The engineer, and the structure, are rather well-known. It's a bit like putting the Tower Bridge in Paris.

Incidentally, when you weld plates over the window to seal in the cast and the plague, you ought to bung up the loos, too. Otherwise the plague will spread everytime someone pulls the chain. On balance, we think it might have been smarter to part **The Cassandra Crossing** in a well-guarded branchline tunnel, and blow up both ends. For good.

People

We'd be obliged, gentlemen, by your stereotyping our employees and patrons with more sympathy and realism. Because fact is, railway people are just like other people.

We're a large and very diverse community, and few of us comply with your present stereotypes. Today, few of our engine-drivers wear funny-striped peaked caps and bib-and-brace overalls - even in the US of A. Not many stationmasters and clerks use green eyeshades and communicate by shouting into 1920-style pedestal telephones. Women occupy many positions in the Railway Service. Our retiring age is below and not above 65, and premature senility is not common.

The record shows that not all of us are subservient putty, when faced by men bent on evil. A lot of us in fact are trendily-dressed, bearded, fit young athletes. They could beat the ***** out of your baddies - and given half an incentive, would elect to do so.

Our patrons are not, in our experience, given to instant mass hysteria, screaming loudly and rushing hither and yon the instant an announcement of possible disaster is given over the train public-address system. We suspect that Amtrak's patrons behave in much the same, stolid way.

In fact, Sir, it's damnably hard to get some passengers to listen to the public address at all. And when you **do** get the message across to move quickly to another car for their own safety, they do it. Quickly, quietly, without their belongings and without panic - as the public's level-headed reaction in the very few train fires we've had has confirmed.

Please advise us in confidence of the identities of your passengers. By denying them Austrailpasses, we can avoid mob stampedes if our conductors have to warn of impending disaster over the train p.a. system. For example, that the buffet-car will close in ten minutes, or that we are approaching Vogger Vogger (A town in Southern New South Wales).

Location

May we point out that in shape, colour and character, railway trains are as individualistic as the national architecture? It's the same with our stations, signals and other lineside hardward. Even the bridges are as different as the scenery in each country.

So if your script is set in Patagonia, Mr Producer, do try to shoot it on location and ask the Patagonians to rent you a train. British Rail and Amtrak just don't fit, even after a quick respray job and the addition of headlights, cowcatchers, sombreros and the like.

Like the people, trains also **sound** different in different countries. For example, when English steam engines whistle, they squeak. American ones go whooo, and most Australian ones hoot like an owl in the mating season. English diesels go de-dah, American and Australian ones go parp or emit a mellifluous chiming whaa. Thanks to the Westinghouse Brake and Signal company, level crossings pass with the same boring doppler effect ding-ding everywhere. And please try, when your stars are riding on a modern railway, to resist the temptation to dub the soundtrack with clickety-clacks. Rails are continuously welded nowadays and coach interiors depressingly silent.

When next in London, could you pass a gentle reminder to your British colleagues to cease using that hackneyed but pleasing clip of a King Class 4-6-0 on a Great Western Railway express? Despite its ambitions, the GWR did not provide service to Scotland, Istanbul or Philadelphia, Pa.

Anachronisms

Just as you wouldn't dream of using a '64 Chev for your upcoming Al Capone production, please do our industry the courtesy of not using a modern diesel in the fifties movie. Most of us (regrettably) still have plenty of old ones to fit your needs exactly. V/Line's even advertised a mothballed fleet of 15 you can buy cheap!

We'd agreed that very old trains in working order aren't as easy to get, and that the museums who might rent you one will take a spoilsport view of your blowing, burning or smashing it up.

To their credit, they'll adopt this view no matter how much money you offer. There are however, still places in the world where some old - very old - trains are still available ex-traffic.

And in most countries with museums, a bit of research will locate the right equipment. This includes Australia, where your industry has generally done better than your overseas colleagues.

Please make a special note, Sir, that not all steam engines are by definition the same, or really old, or old enough. Modern postwar jobs won't fit into pre World War I movies anymore than a Buick Roadmaster, Morris Minor or FJ Holden would substitute for a Darracq or Model T.

Instead, use a genuinely old engine and if it's been modernised, unbolt the electric headlight and smokebox wings. If you have to, disguise the cab

with plywood and so on. The same applies to the rest of the train.

Over-exposure

May we recall, Mr Producer, that we are tired of seeing:

- in the States, that same old Sierra Railroad 4-6-0 that's been over-exposed in so many films and TV series that its black paint must by now be a pale grey?
- in Britain, the Dart Valley Railway, where by now we know every sleeper? And where freshly-whitewashed stripes on the platform edges, a product of the blackout in World War II, may look neat but don't gel with a period after World War I.
- in Europe, the SCNF's only operating steam engine, the ex-Nord 4-6-0. This is alleged to have taken its train all the way from Calais to Istanbul and back. There are many other serviceable puffers in Europe and changing engines at the frontier stations was a characteristic feature of an international journey.

Variety, Sir, is the spice of railway life as well as the name of your industry's trade journal.

Australian Movies

Most of your Australian colleagues, Mr Producer, seem to have taken sound advice and few liberties when trains are concerned.

QR featured in *The Mango Tree* (a pity they didn't re-paint the logo), NSW in *Seven Little Australians* with just the right atmosphere of the old NSWR and several different trains, too.

VR featured in *The Man From Snowy River* but with a rather modern steam engine.

The old S.A.R. on Pitchi Richi Pass stood in for Westrail in *Gallipoli* (an SA film company made it) but Westrail struck back gamely with the recent TV series *A Fortunate Life.*

We have few complaints but one. When, Mr Producer, is your industry going to make a movie about one of the great Australian railway builders? We don't have red indians, as *Union Pacific* (and many others) did, but we surely have the ingredients of drama and visual impact.

Clashes of political and vice-regal wills, contractors with influence, a dogged engineer's determination, heroic construction work in spectacular scenery, and even an unhappy ending in the complete lack of contemporary appreciation - all are there in Thomas Whitton's story *The Great Divide* (still, alas, to be made).

We also have most of the hero's important structures unsullied by electrification masts, enough contemporary equipment, and (at Thirlmere) even a base on a suitable isolated line to span his complete period.

Westerns

Westerns remain high on our list of popular movies and our industry applauds the general expectation that every Western should include a train, even if it is not held up. But not **any** train.

Yes, the Rio Grande narrow gauge ran through scenic territory, and had some nice period wild-west trains.

Unfortunately, the remaining rumps of tourist steam railway in Colorado are internationally known and widely photographed by now.

The engines they still use (K36 Mikados) date from between the wars, by then train-robbing was somewhat unfashionable. And, being big brutes - bigger than David Hill's green 3642 - a K36 doesn't disguise too credibly as an 1880 - era puffer.

Places like Colombia and Ecuador still run small, old engines and are, we understand, amenable to hard cash offers. The scenery's great, too.

If Sir, you set your Western in the Spanish desert country to avoid the RSPCA when you hurt the horses, please remember that the American railroads didn't use German-style engines and 4-wheel box cars, even though the old West may well have seen a confused Samurai warrior who caught the wrong train at Oakland Pier.

Using Your Train

Having obtained your train from us, please try to ensure that what you do with it is at least remotely achievable. For like tracks and signals, our trains are expressly built to prevent most of the things that your scriptwriter has called for.

Especially, we'd add, the nasty things. For example:

- Trains have, for the last century or so, had continuous automatic air (in some places vacuum) brakes, which go on as soon as anybody pulls the communication cord, divides the train, or pumps a .45 slug into an air hose between the cars. Both halves of the train then stop - and quite quickly, too.
- The only way for your heroes (or baddies) to avoid this is to bleed the system on every car by operating the shunter's release valve on every car. Since shunters work at ground level, this gadget happens to be located at the underframe (chassis). You may reluctantly agree that it's rather difficult to disconnect the brakes or neutralise our brake system from inside a moving train doing 100 km/h. This was our spoil-sport designers intention at the time.
- When the communication cord is pulled on a fast-moving train and the brakes go on, hard, some of the things that **don't** happen include:

(1) a tremendous longitudinal shock

(2) passengers being thrown to the floor

(3) luggage falling on them

(4) brakes screaming. (If old-style iron blocks, they emit a steady low-pitched roar. Modern disc or composition block brakes emit virtually no discernable noise at all)

(5) the passengers do not scream, either. But the driver usually swears (if he is watching his flowmeter)

(6) the driving wheels of a steam engine do not lock solid and send a shower of sparks from the rails.

Sorry about that. The only jolts and bumps are at the final stop - which you can establish for yourself by pulling a communication cord or better, the air cock at the end vestibule. The price starts at forty dollars and the experience of a most unpleasant interview with our staff, who are in other circumstances quite friendly.

On falling off trains, our statistics contain few records of falls from the roof. Incidents where patrons fell or jumped off the car from the floor level suggests that the chances of serious injury are much higher than your industry's general understanding, and usually fatal at speeds over 30 km/h. Our experience as railwaymen also leads us to conclude that most objects besides railway lines are not springy bushes, but solid and unyielding. They are not all pleasant even to stumble into, let alone to fall upon from a great height at express speed.

In warning your hero and the stunt man on these matters, you might also advise him not to waste his time trying to uncouple cars from a moving train when the train is pulling.

This is virtually impossible to achieve, because automatic couplers are designed expressly to prevent it. They will uncouple only when there's no tug between them and on passenger cars, only after a special lock is also released (from ground level).

Under a pull, the old-style link and pin couplers were even less obliging, requiring the use of a sledgehammer. Also, you have to bang the pin **upwards,** from underneath. This is rather difficult to do, unless you lock you legs around the platform railings, lean downwards and work upside-down with your head between the rails. We don't recommend this practice!

Staging Wrecks

If you must wreck one of our trains as a climax to your movie, please remember that our modern passenger cars are designed to be wrecked with the minimum possible damage to the humans inside. This means that they won't smash up in anything like the artistically-satisfying way you desire. They will obstinately tend to stay coupled, upright and in line, and to dent, buckle and crumple rather than breaking into bits like the old wooden ones did.

We have yet to see a realistic movie wreck using models, even with all the slow-motion dodges of the special effects department.

This is partly because of the laws of physics (you cannot scale Nature) and partly because constructing a large-scale model that bends realistically would probably cost your industry more to build than our industry would charge you for a real train off the scrapping siding.

When you wreck one of our trains, the air brakes will apply in full-emergency, braking hard as soon as the first hose breaks apart.

On a long train, in fact, more of the train's kinetic energy is dissipated by the brakes at the back of the train than by the wrecking process at the front (or vice-versa, when you roll back down a hill).

This will substantially reduce the consequences and spectacle value of your wreck, a further instance of real life cramping your style.

The old "non-air" trains of course smashed themselves up in a much more satisfying way. That's why we got rid of them.

Because dents, buckles and crumples still cost a lot of money to fix, and replacement passenger cars can cost us up to a million dollars each, you'll find it depressingly expensive to achieve even a modest and rather unspectacular result if modern cars are involved. Old diesels are cheaper and tougher.

We suggest you change the date of the movie. Our industry will be pleased to sell you lots of old freight cars, the odd obsolete diesel and (if there's any still left) perhaps some old wooden cars, too, from the scrap track or the perway gang's siding.

But please be careful to spray them over in somebody else's colours - every Commissioner values high system's image.

Bangs and Burn-Ups

Unlike aircraft, and the nitroglycerin-fuelled motor cars unique to your industry, it is rare for railway trains to explode on impact with Mother Earth at the bottom of a gully. Some cargoes might, but even in a full-scale head-on, steam locomotive boilers blew up only rarely. Although you never know. One memorable exception being a staged head-on wreck between two trains at Crush, Texas in 1896 for which tickets were sold and a crowd of 30,000 turned up. Both boilers exploded with fatal results in the crowd (careless operation causing low water over the fire box being the usual cause and with a big engine, much more spectacular if the crown plate let go).

Derailed diesels sometimes spilt fuel (which is why we switched our older rail motors from petrol to diesel). But only rarely. Diesel burns as a slowly-developing spilt-fuel fire, rather than the instant fireball effect your industry seem to insist upon.

If your story has to end with a big bang and burn, we'd suggest a freight train with a few tank cars of chemical nasties. But don't expect to film this in Australia - our railways handle very few dangerous loads of this kind, and the special tank cars cost up to $200,000 each.

You can do it

If you think, Mr Producer, these strictures are carping, please recall that many of your colleagues have managed to do better - in fact to be right-on. And this despite all the difficulties of location, budget, and the declining availability of period hardware.

For example, no doubt you have seen:

- **The First Great Train Robbery** whose producer faced the formidable difficulty of re-producing an 1851 railway environment. A Dublin station was minimally altered to resemble old London Bridge; and old 0-6-0 goods engine of 1885 was cleverly disguised to make a very credible double-framed South Eastern Railway 2-2-2 express, and some correct period coach bodies were built on CIE's modern 2-axle underframes for safe operation at 90 km/h speed. This film was also notable for the wide variety of specialised early Victorian horse drawn vehicles for milkmen, knife grinders, undertakers, etc, etc, in its street scenes. (The anti-hero's son became the Lord Mayor of Sydney, and his picture is on the Town Hall Staircase).
- **North-West Frontier** (Kenneth More) set in Baluchistan, where some very clever mixing of similar 1000 and 1600mm gauge rolling stock in different parts of the country created a near-perfect railway setting. Other top-class subcontinent movies with impeccable railway scenes were **Bhowani Junction** (shot in Pakistan) and the recent **A Voyage to India.**
- **Silver Streak.** Air brakes, uncoupling, and some rather ramshackle "transcontinental" track forgiven, this was a not-too serious movie with not-too-incredible use of Canadian Pacific coaches. Sheer escapism, it ended with spectacular buffer-stop crash in which an old F7 diesel did a satisfying slow-motion demolition job on a station concourse (presumably a set built over extended tracks).

(continued on page 52)

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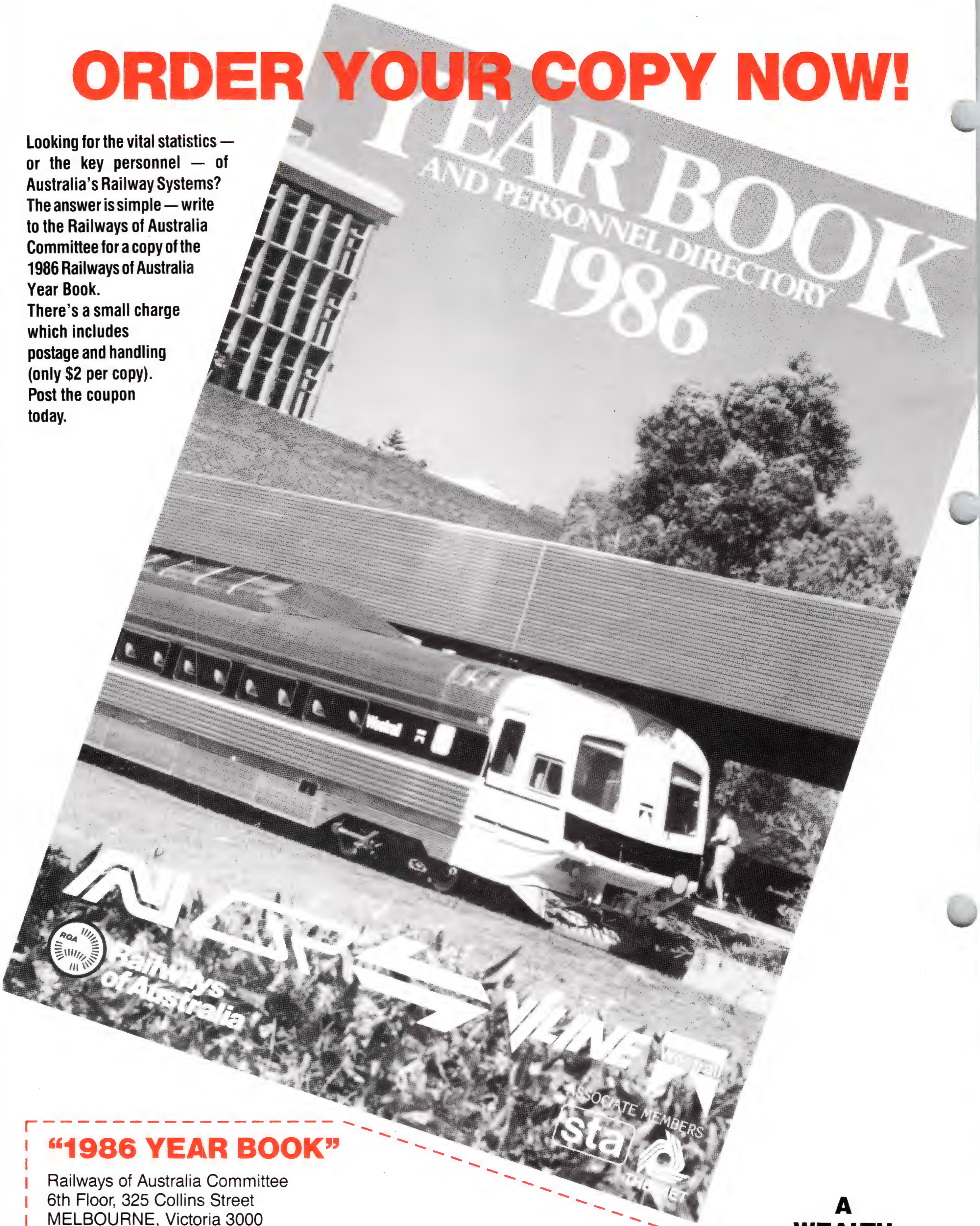

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Revival for Mortuary Station

In the film "Birdsville," Sydney's Mortuary station becomes Roma Street (Brisbane) station.

Mortuary station has a new lease of life — this time as a restaurant.

The restaurant, to be set in two old railway carriages provided by State Rail, will be operated by Shield International Marketing.

The company will restore the carriages to something like the elegance of Orient Express dining cars.

The restaurant proposal was chosen by State Rail because it preserves the historic character of the old building.

State Rail will ensure that the station is not altered and that the proposal goes ahead only after full consultation with the Heritage Council.

The station is a fine example of Gothic revival-style architecture.

It was built in 1869 and used for funeral trains to Rookwood and Woronora cemeteries until the late 1940s.

Since then it has had a chequered history - being used as a brewery depot and later as a parcels depot - and developed quite an "off" look.

But a two-year $600,000 restoration by State Rail has changed that.

The restoration, as part of State Rail's commitment to maintaining elements of its past, involved reinstatement of the original pattern slate portico roof, copper spire, roof vents, front stone steps and iron picket fence.

Atmosphere

The atmosphere of the station has been widely appreciated by film crews and people staging special functions, who have given the station the star treatment.

It has featured in:

- two major Australian movies ("Birdsville" and "For Love Alone");
- a TV mini-series "Land of Hope";
- film clips and advertising promotions;
- a dance-drama TV series "Dancing Daze";
- still photography fashion layouts;
- parties and other functions;
- a "Whodunit Weekend" (Murder on the Errant - steam - Express);
- steam train excursions (including the centenary of Rosehill racecourse); and
- the premiere of the U.S. horror film "Nightmare on Elm Street".

For the "Elm Street" function a specially-fitted suburban double deck electric train took guests from Town Hall station to Mortuary station.

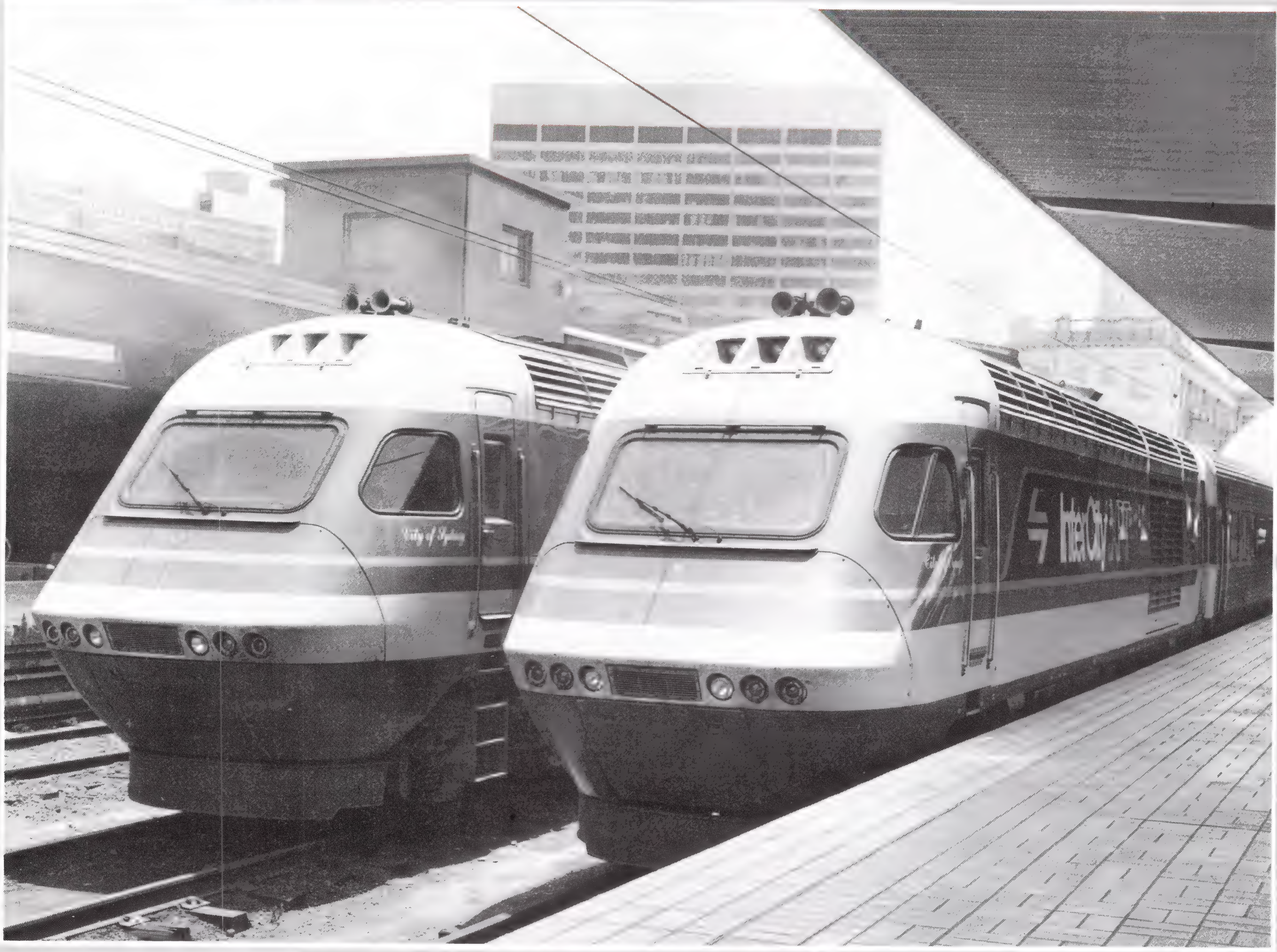
Bull Stars

In "Birdsville", Mortuary station becomes Roma Street (Brisbane) station, where the star is a bull which kicks its way out of a cattle wagon.

The film, by PBL Productions, is based on the true story of the first man to drive cattle down the Birdsville Track from Queensland to South Australia.

In "For Love Alone", starring Helen Buday, Sam Neill and Hugo Weaving, Mortuary station becomes the London stations Oxford and Paddington.

The hiring fees paid for Mortuary station have provided State Rail with an unexpectedly good source of income.



XPT trains at Sydney's Central Station

By Roy Sinclair

If I write with some enthusiasm about Australian Railways the friendly railway staff I met during a recent Australian rail journey would have to be partly responsible.

Australia's railways are refreshing and they are run with considerable imagination. After all, in what other country could a humble railway pie become a celebrity?

Many New Zealanders, including our Prime Minister, David Lange, have discovered that rail travel in Australia is a pleasurable experience. Two years ago, John Leslie, a respected New Zealand journalist, travelled on the Sunlander during a holiday in Queensland.

His story about the train journey to Cairns created considerable interest when it appeared in a Christchurch newspaper.

My own interest in Australian railways started almost twenty years ago when I married an Australian girl at Bacchus Marsh near Melbourne. We returned to live in New Zealand in 1969 and since then I have had opportunities to see something of the Australian railways during family visits.

I have travelled on the Victorian Railways (now V/Line) and many interstate services. I have fond memories of the Westlander and of eating a delicious breakfast cooked on an old wood stove as we rode the final kilometres towards Perth.

Last December we made our first visit to Australia in five years. This time I planned a railway trip with my 10-year-old son, Paul, on the Melbourne-Sydney line. The main object of the journey was to travel on the InterCity XPT from Sydney to Albury.

The New Zealand Railways have a special Australian Rail section. I made all my bookings at the Christchurch railway station.

Peter Smith, the NZR employee who presently administers Australian Rail in Christchurch, is extremely efficient. He has a comprehensive knowledge of Australian railways and I later discovered that his efforts are appreciated by Air New Zealand and other Christchurch travel agencies who book Australian railway journeys.

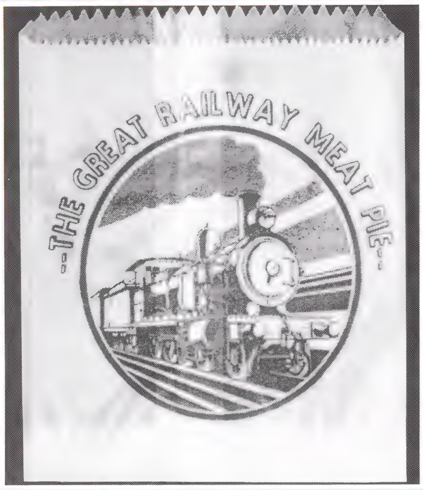
Our Australian journey started early one January morning when Paul and I boarded the 6.28 am train from Bacchus Marsh to Melbourne.

At Spencer Street we had plenty of time for breakfast before boarding the Intercapital Daylight for the 960 km 13-hour run to Sydney.

I had travelled by Intercapital Daylight once before. That was in 1968 when I

A PLEASURABL

The Intercapital Daylight preparing to leave Albury for Sydney



I enjoyed a railway pie as the Riverina XPT sped towards Albury — where else except in Australia, could a humble meat pie become a celebrity?

returned to Melbourne from Sydney with my wife at the conclusion of our honeymoon.

It was a nostalgic experience to join the same train with my son almost two decades later.

Our train departed right on time at 8.40 am for the non-stop 317 km run to Albury. By New Zealand standards it was a fast trip taking three hours and twenty-five minutes.

During that time we enjoyed our second breakfast, this time in the dining car, and reflected on Australia's rather unusual railway history:

The first Australian train, I am told, ran between Melbourne and Sandridge on September 12, 1854.

The line was only 4 km but such was pioneer Australian ingenuity that they not only built the railway; they also constructed the small steam locomotive to run on it.

That first railway was built to a gauge of 1600m (5ft 3in) which became the permanent rail gauge in Victoria and South Australia.

The same broad-gauge was used for New Zealand's first steam-powered railway opened between Christchurch and Ferrymead on December 1, 1863.

When New Zealand's railways were converted to the present 1067m (3ft 6in) gauge in the 1870s, the broad-gauge locomotives were sold to South Australia.

Unfortunately, the ship carrying the equipment was wrecked on the west coast of the North Island. Some of the locomotives were salvaged and actually ran in South Australia.

The others remained in New Zealand and as far I know they are still on the beach where they were washed up in 1878.

As our Intercapital Daylight sped along the 1435mm (4ft 8½in) standard-gauge line which runs parallel to Victoria's broad-gauge, I wondered if Australian ingenuity might have got a little out of hand when they decided on rail gauges.

The different gauges on different systems must have caused more than a few headaches over the years, especially when Sydney-bound passengers had to change trains at Albury in the middle of the night.

The variety of rail gauges still existing in Australia can be turned to profit: Specialised railway tours are now fashionable throughout the western world. The New Zealand Government Tourist Bureau run successful railway tours for American and Australian tourists and I have often seen a comprehensive railway tour of Australia advertised in the American TRAINS magazine.

Where else in the world, except between Melbourne and Albury, could anyone experience two different gauged railways running parallel for 300 km and have the chance to see trains from different systems travelling side by side?

We had that experience when we were on the Intercapital Daylight. Our train was being hauled by a State Rail 442 class and before we reached Albury we caught up with the Albury express which had left Spencer Street a few minutes before us.

It was being hauled by two newly-painted orange and grey V/Line diesels and for several kilometres the two trains ran together before arriving

E EXPERIENCE

at Albury's long platforms at the same time.

At Albury an almost new 81 class locomotive took over our train for the long 645 km run to Sydney. A product of Clyde Engineering at Bathurst, the 81 class is the most powerful diesel-electric in the State Rail fleet.

Our locomotive, rated at 2240kW, had sufficient power to haul the train over difficult sections of the railway without assistance.

As we travelled through southern New South Wales we saw numerous long wheat trains with two 81 class locomotives at the front.

The New South Wales system, on which we spent most of our journey, has 9,884 route kilometres, almost twice the length of our NZR.

However, State Rail carries an impressive 46 million tonnes of freight compared with about 11 million tonnes on the NZR.

I was told that one thousand freight trains run in New South Wales each day.

The dining car was an excellent feature of the Intercapital Daylight.

Even the view from Sydney Tower can not compare with the pleasure of enjoying a meal on a train as the countryside flashes past the window.

The day we travelled the train was fully-loaded and the dining car staff had a hectic time. Inevitably, mistakes were made and some items on the menu ran out. Nevertheless, the staff coped well and did everything possible to compensate for any lack in the service.

The dining car was also an ideal place for meeting people. At the evening meal I asked the person opposite why anyone should spend 13 hours on a train when Sydney could have been reached in only one hour by air?

He said that he was taking his family for a holiday in Sydney and the journey was an enjoyable part of the holiday.

He was a locomotive driver working for Australian National Railways in South Australia. The previous evening he had set off with his family and travelled from Adelaide to Melbourne on the Overland.

We talked about railways and during our conversation he told me that old ladies had often asked him if they could ride in the locomotive.

Our train ran to time throughout the day and only lost a few minutes negotiating Sydney's extensive suburban network.

Before our arrival at Central Station we were given a friendly farewell over the train's public address and an apology for our late arrival even though it only amounted to seven minutes.

It had been a good journey but after the long day I felt tired as we walked along the station platform; too tired even to appreciate the posters proclaiming, "The Great Railway Meat Pie is Back!"

Before we left New Zealand I had contacted State Rail telling them about my interest in the Inter City XPT which had revolutionised rail travel in New South Wales.

Next morning we were met by Warwick Stoddart, State Rail's engineering manager for locomotives and rolling stock, and taken to the XPT maintenance centre at Sydenham.

It is an impressive complex specially built to service the new trains.

Warwick spent some time explaining the XPT, the services it ran and how it compared with the British Inter City 125 from which the XPT was designed.

Except for its livery, the XPT looks remarkably like its British counterpart

We went to Sydney to sample the Inter City XPT, however the opportunity to photograph Baldwin-built D59, No. 5910, at Central Station was a welcome bonus.

but Warwick told me (with an amused chuckle) that the Australian train was the better of the two.

My son finds trains built for the 1980s much more fascinating than the older steam-powered railways. (Although he did show some interest in the D59 No 5910 we saw at Central Station).

He is already a budding electronics expert and he particularly liked the view of an XPT power car from underneath.

He said he was surprised by the small size of the electric traction motors.

Presently, there are six sets of Inter City XPTs in service. Each train comprises five carriages and two power cars, one at either end of the train.

A 12-cylinder Paxman Valenta diesel-electric rated at 1492kW drives each power car. With almost 300kW to power a train of only 377 tonnes, the XPT has a high power to weight ratio (about 8kW per tonne). This is an important factor in reducing travelling times.

Each XPT runs some 7,200 km every week and the maximum operating speed is 160 km/h - 50 km/h faster than conventional passenger trains.

On September 6, 1981 an XPT claimed a new Australian rail speed record when it reached 183 km/h between Albury and Wagga Wagga.

I believe that State Rail went to some trouble selling the idea of high-speed rail travel in New South Wales.

Warwick told me that State Rail asked people what type of services they wanted and then went to some considerable effort to provide them.

The result was favourable passenger loadings.

State Rail employees asked a number of questions about the New Zealand Railways and how they compared with what I had seen in Australia. I said that New Zealand could learn a lot from Australia about passenger services.

Obviously, New South Wales and Victoria have got their act together and both states now run excellent trains.

In some areas, however, the NZR is very much up to date.

One recent innovation is the computerised Traffic Monitoring system (TMS), a New Zealand development which has revolutionised the control of locomotives and rolling stock. Warwick told me that State Rail was very interested in New Zealand's Traffic Monitoring system.

We were taken to the Railway Shop in Central Station. I thought that a shop set up and staffed by State Rail especially for enthusiasts was a masterpiece in imagination.

Paul and I spent a good number of our Australian dollars in the railway shop. Included in our purchases was an HO-scale model of the Inter City XPT which now runs on our model railway at home.

The most exciting part of our journey came next day when we prepared for our journey back to Albury on the XPT Riverina Express. Alas, when we arrived at Central Station in plenty of time for the 12.10pm departure, there was no train in sight.

It had broken down on the run from Canberra and when it finally arrived it was being towed by an old diesel locomotive. To add insult to injury, one of the carriages had a broken window.

It took almost an hour to exchange the failed power cars, replace the window and clean the train for its next run. In an effort to quell any bad feelings owing to our late departure, we were provided with free tea and biscuits served on the platform by railway staff.

When we finally departed at 1.15pm we found the XPT wonderful to ride in.

There seemed to be little sensation of speed and the seats were comfortable being similar to those in an aircraft but more spacious.

I was impressed by the use of automatic doors between carriages and the many features incorporated to cater for disabled travellers.

Through the courtesy of State Rail and locomotive driver, Lance Daley, I was permitted to ride in the power car for the 260km between Goulburn and Junee. It was an exciting experience and I was able, at last, to fulfill an ambition to sit beside an engine driver when a train was going 100mph (160km/h).

Lance knew the road well, having worked engines over it for most of his working life.

When he drives the XPT he knows he will be speeding along at 160km/h; a tremendous change from his steam days, but looking back he sometimes wonders how often the old 38 class locomotives had hit that speed without their drivers ever knowing.

Only one hour and 25 minutes are allowed for the 161km from Junee to Albury. We took the opportunity to visit the buffet and sampled "The Great Railway Meat Pie".

The pie was excellent and the bag it came in was worth taking home as a souvenir. I wondered how many State Rail pie bags are in railwayiana collections around the world?

XPT power car, City of Sydney, at Sydenham's XPT maintenance centre. This was the power car I rode in with Lance Daley from Goulburn to Junee

We arrived in Albury just after 8 pm. The 644 km run from Sydney had taken only 6 hours and 55 minutes.

Two days earlier, the Intercapital Daylight had taken us from Albury to Sydney in 9 hours and 31 minutes.

The high-speed trains must be one of the best things that has happened to Australian railways for many decades.

No doubt many travellers are looking forward to a Sydney-Melbourne service.

Our journey to Melbourne was completed next afternoon on a broad-gauge V/Line train. Although not in the same class as an XPT it was still a very good train and it gave us a smart run to Melbourne.

We had also experienced something that was once an everyday event for travellers on the Sydney-Melbourne line: We had changed trains at Albury and travelled over two rail gauges.

Back in Victoria we made a number of shorter railway journeys on the Melbourne-Ballarat line. As we had come to expect, the trains were very good and the staff were courteous.

On the day before we flew back to Christchurch we were returning to Bacchus March on the Ballarat train.

The carriage was full and a young woman set up her guitar and started quietly singing Australian folk songs.

No one objected.

The sound of her music, the motion of the train and the dry landscape speeding past the window all seemed to work together.

It was an experience I will never forget and a fitting finale to our Australian railway journey.

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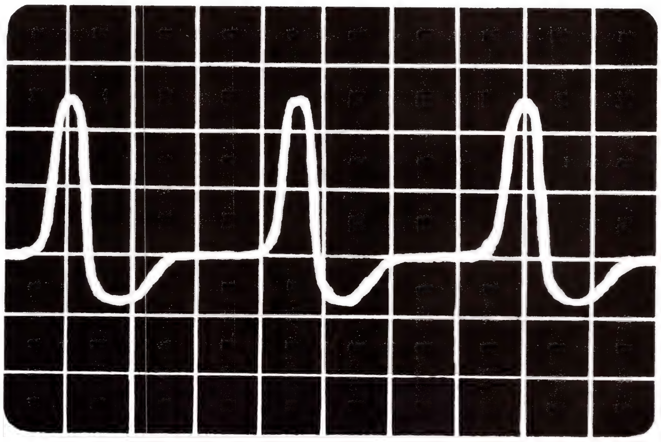

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Train Movies . . .

(continued from page 45)

- The second (1950s) version of **Thirty Nine Steps** (reset as a postwar thriller). Kenneth More (who must have had a good head for high bridges) pulled the cord of the London-Aberdeen express on the Forth Bridge, and under it despite a police search and evaded detection. There were some magnificent railway shots in this film, in which the big A4 Pacifics-pulling out of the Waverley in Edinburgh and striding across this great bridge - rivalled Mr More for stardom.
- **Minder on the Venice Simplon Orient Express** was well done - but of course, using existing equipment in a present-day setting.
- **Chariots of Fire,** for which a genuine 1924 East Coast Joint Stock sleeping car express was laid on, complete with a "Large Atlantic" loco - and a genuine 1924 boat train as well. Even a credible between the wars turbine packet steamer was cast - an Isle of Man boat, and the last of her kind still running.
- Some classic Western such as **High Noon, and Breakheart Pass** in which the film-makers got it absolutely right. Breakheart Pass has the best-staged wreck in any recent train movie with old style wooden equipment.
- **Dr Zhivago,** where Canadian mountain scenery, Spanish (?) equipment, old Finnish trains in the wooden steppes, and an American Birney tram in a Moscow street set combined to capture the realism of the 1917 Revolution in transport as well as story terms. Do you remember the arrival in the Moscow terminal of that splendid pre-1914 express, with its glittering wagons-lit? The train of wooden boxcars the Zhivagos took from Moscow? The evil-looking armoured special of the awful Commandant Strelnikov? Everyone stepped out of **his** way!

Such differences, we suggest, stamp the moviemaker as a professional, just as much as his other decisions on script, photography, music and casting.

Being moviegoers - as well as railwaymen we trust, Mr Producer, that you will take our suggestions in good spirit.

Your sincerely,

Network

North Americas for STORE 1986

STORE - 1986, the Institution of Engineers, Australia's Study Tour on Railway Engineering to the USA and Canada from 7 October (arrive San-Francisco) to 24 October (depart Chicago) is definitely ON.

Jim Michel, the National Committee on Railway Engineering's North American member, has put together a first-class technical programme including attendance at the International Heavy Haul Conference in Vancouver BC (with technical sessions, inspections and tours) as well as visits to railway and other installations in San Francisco, Seattle, Vancouver, the Canadian Rockies, Denver, and Chicago. Following are some of the highlights in STORE:

San Francisco: Rebuilding of the cable car system. BART operations and visit to the Operations centre (particular interest to communications, signalling and electric power engineers). BART train ride and workshops (for rolling stock and civil engineers). CALTRANS commuter operations with Japanese-build 2-deck cars and EMD F-40 diesel locos.

BART and MUNI underground lines — a three level subway system built along a earthquake fault line. Pre-tour options: Yosemite National Park, Sacramento Railway Museum, self-drive trips to redwoods.

Seattle: BN container port — new generation double stacked container and other intermodal vehicles. Alweg monorail. Seattle waterfront tramway.

Boeing aircraft factory (see the Jumbos being built and the high tech (757/767).

Vancouver: Full Heavy Haul Conference programme — registration is included. BLR Tumbler Ridge briefing. Roberts Bank Coal Terminal (our big Canadian competitor).

Advanced Light Rail System — including rolling stock, guideway and control centre. Expo-86 (which has a transportation theme). Sea Bus operations. Heavy Haul conference excursion — "Royal Hudson" 4-6-4 steam engine. Excursion on CN and CP railroads up the Fraser River Canyon to inspect track, equipment.

Inspection of CP Rogers Pass deviation and 9.1 mile tunnel.

Denver: ARR Test Centre at Pueblo, Colo. Rio Grande ride (Amtrak Superliner stock) to Glenwood Springs. Modern signalling centre, in Denver.

> 'A very large variety of modern systems to see'

Chicago: Chicago remains the railway hub of North America with a very large variety of modern systems and installations to see, the Chicago Transit Authority's lines included. The group will be expertly briefed on these, with trip options as follows: AT and SF Corwith yard - modern intermodal yard handling 2000 containers/road trailers daily. CTA Airport line - complex construction problems. Regional Transit Authority/BN push-pull commuter operations, including shops. Tour of EMD-GM Plant at LaGrange (no competitors, please!) Illinois Central Gulf Despatch Centre - runs a 925 mile main line, Chicago to New Orleans. ICG Woodcrest shops (1973) - loco, 1500 Vdc EMU, passenger and freight cars. AMTRAK car maintenance facility (1981).

AMTRAK central reservations office.

AMTRAK technical centre (laboratories). RALES loco simulator at the Illinois Institute of Technology. Farewell dinner.

Post-tour options in the Eastern USA (accessible by AMTRAK railpass) include in the Philadelphia area, the NE Corridor Improvement Programme, the signal and electric traction control system, field visits, tracklaying machinery techniques, computer aided drafting and the PATCO (lindenwold) high-speed commuter transit line.

The technical sessions at the Heavy Haul Conference are divided into three full-day topics: (Tuesday) Wheel/Rail Interaction in all aspects including wheels, rails and bogies; (Wednesday) System Control and Automation, including train control, handling, and robotics; (Thursday) Track and Vehicle System Design, including maintenance aspects and covering track and pointwork aspects and electrification.

The all-up budget cost for the basic tour remains $A 5200. If final numbers cause higher costs, registrants will be able to opt out by the end of July.

However, it is the firm intention that even if only a minibus load of people attend, STORE-1986 will be on, and will be escorted by Jim Michel.

For full programme and registration details please contact: Mr Barry Hewish, Conference Manager, IEA,UST, 11 National Circuit, Barton, ACT 2600. Telephone (062) 733-633. Telex AA 62758.

For more trip details, phone Ian Macfarlane (062) 813-489 in the evenings.

For more trip details ring Ian Macfarlane (062) 813 489

Delights await the visitor on Hotham

Victorian visitors to Western Australia, particularly during the America's Cup period, have an excellent oportunity to see something of the countryside around Perth by using rail tours conducted by the Hotham Valley Tourist Railway.
Len Purcell, editor of ***Pinjarra Steam Express*** *(journal of the Hotham Valley Tourist Railway) here gives some background to this well-developed tourist facility.*

When three residents of Pinjarra, 84 km south of Perth, sat on the local railway station twelve years ago and chatted about what appeared to be the bleak future of the local branch railway to Dwellingup, 24 km away in the Jarrah timber country, they could not have visualised the healthy active preservation movement that would stem from their discussion.

Speaking at a recent birthday party of the Hotham Valley Tourist Railway, its vice president Glen Edge, one of the three founders, said they had thought they would have a quiet little group which could go trolley riding at weekends.

He said they thought they might acquire a steam locomotive which they would polish up for the odd train trip. This was reflected in the original name of the movement — The Hills Railway and Steam Preservation Society, changed in 1979 to Hotham Valley Tourist Railway (W.A.) Inc.

It was realised the branch line was more than a decaying railway, servicing a Dwellingup sawmill with one train weekly. It was a remnant of man's early endeavours to open up the western third of the continent.

All other railways climbing the scarp into the Darling Range to gain access to Jarrah forests, wheatlands or goldfields had either been drastically modernised or completely removed. Here was a railway which retained its original character and was scenically located a handy distance from Perth.

Known as the Hotham Valley Branch at its peak, the railway not only serviced an extensive timber industry but went beyond the forest, on through wheat and sheep farming areas to Narrogin on the Great Southern Railway, a distance of 150 km.

However, the eastern extremity lasted but 35 years until 1961 when the railhead was withdrawn to Boddington. Decline of timber milling beyond Dwellingup and road improvement programs in farming areas brought a rapid decline in freight loadings, and in 1969 the railway was closed beyond Dwellingup. Because that section passes through die-back quarantine areas the track has not been lifted. This fact has enabled the Hotham Valley Tourist Railway to partly realise its dream of running a real 'bush railway' beyond Dwellingup.

The idea of a small group playing trains quite quickly evolved into a businesslike Society which set about its preservation program with determination.

Because the 24 km railway into Dwellingup abounds with stiff grades and small radius curves, locomotive operations are restricted to a few classes.

The W Class, mountain type, which had proved its capability over this track in the closing days of steam, was the obvious choice for a preservation group planning to run tourist trains. No less than four of the W locos were secured from the edge of the scrap heap and progressively, three were put back into service. Restoration of the fourth will be completed this year.

Operations began in 1974 when the fledgling Society ran a diesel-hauled train from Perth to Dwellingup to gauge public interest. And interest there was in plenty. When the first steam excursion rolled out of Pinjarra in 1976 potential riders were battling for seats.

That one train in 1974 expanded to twenty-six trains over the line in the winter and spring months of 1985.

And besides that, an extensive program of diesel and steam-hauled tours, ranging from one to three days duration, have been undertaken over a wide area radiating out from Perth or from the Society's steam depot at Pinjarra.

Trains are normally made up of Westrail passenger stock but the Society has its own fleet of eighteen coaches including a 1916 vintage dining car in immaculate condition, a buffet car and six ex-Tasmanian suburban saloons. There are also two main line water tankers for loco support.

Although the traffic side of Hotham Valley's operations is handled by Westrail personnel, preparation, management and journey supervision is overseen entirely by Society volunteers.

On extended weekend tours, such as that to Pemberton or the more than 900 km Wheatbelt Explorer, eighty passengers are carried in a steam-hauled train. They enjoy their midday meals in the dining car in the fashion of yesteryear. Night-time accommodation is in selected motels.

On the last Sunday in July each year a diesel-hauled twenty-three car train travels from Perth into the Avon Valley carrying some 1200 passengers who view the thrills and spills of the 'Avon Descent', a white water event which involves a variety of boats from surf skis and canoes through to high-powered vessels.

The train travels along, parallel with the river for more than 70 km, wandering along at little better than walking pace while passengers jam the windows to thrill with competitors battling in the foaming water.

Hotham Valley does not see itself as a tour train operator outside the orbit of steam-hauled services. But restoration of rolling stock and purchase of sleepers is expensive, and well-run, well-patronised tours are excellent money spinners.

During the bushfire season (November-April) when severe fire hazard conditions prevail and the use of steam locomotives is precluded, diesel hauled trains provide outings to beach resorts (such as Busselton) or to the Apple Festival at Donnybrook.

What Hotham Valley Railway is about are those twenty-six picnic trains which

'Passengers enjoy the sight, sound, smell o

ley Railway

- from 1 May to 31 October - steam from Pinjarra to Dwellingup.

Tourists leave from Perth on Sunday morning, often two each Sunday, behind a diesel locomotive which gives way to two W Class locomotives at Pinjarra. Then it's over the Murray Plains and into the hills, both locomotives working to capacity to lift a nine-car train up to 212 metre climb to Dwellingup.

Kilometre after kilometre of 1 in 32 gradient are mastered, the flanges protesting loudly at the sharp curves while the passengers enjoy the sight, sound and smell of steam at work.

To handle seat reservations, and to ensure its patrons enjoy the best of care and attention, Hotham Valley has developed a fully computerised reservation, seat allocation and ticketing system. This year its office will move from a suburban home into a central city shop of its own.

Restoration of rolling stock and re-sleepering of railways has been accelerated by Community Employment Program grants, and keen Society supervision ensures a high standard of workmanship.

A large carriage depot is established at Dwellingup. This, and the extension of the former Westrail loco depot at Pinjarra, ensures the Society is well set for the future.

Eight kilometres of freshly rehabilitated railway east of Dwellingup will be the basis for a 'Puffing Billy' type of operation, using an 88-year-old ex-sawmill railway wood-burning loco. Parallel with this, forest walk trails will be developed and picnic facilities for day trippers to Dwellingup are to be re-designed as, too, will be the railway station complex.

All in all, it can be truthfully said that Hotham Valley Tourist Railway volunteers have been very busy indeed - and the future appears to offer very little in the way of breathing space.

steam at work'

No time to waste for QR's Telecommunications Section

The first week of February, 1986, was a period of intense activity for the Telecommunications Section of Queensland Railways.

During the first two days (a weekend) three major components of the new telecommunications network being provided to service Stage 1 of the Main Line Electrification Project were brought into operation to carry the Department's voice and data traffic between Gladstone and Rockhampton.

The major items of new equipment commissioned included:

- 110 km of single mode optical fibre cable, the longest section known to be operated in Queensland and possibly in Australia at this time. The optical fibre cable was supplied by OLEX in lengths up to 5 km, and was installed and jointed by Kilpatrick-Green.
- Four Pulse Code Modulation (PCM) transmission systems and associated 2 and 8 Mbit/s optical line terminating (OLTE) equipment for the 6 fibre cable. All PCM and OLTE equipment was supplied by NEC Japan and installed by NEC Australia.
- The 110 km coastal section of a partly equipped 300 channel analogue microwave radio transmission system being provided between Gladstone, Rockhampton, and Blackwater as part of the Main Line Electrification Project. This system is being supplied and installed by Plessey Australia using radio from OKI (Japan) and multiplex and antennae equipment from STC and Andrews respectively.

In the following week all channels previously provided on the Gladstone-Rockhampton section by 12 channel open wire transmission systems were transferred to the new cable and radio systems.

In addition, several new services were implemented in conjunction with the extra transmission capacity available. The number of dial junctions between the Gladstone and Rockhampton telephone exchanges was doubled to provide much needed additional capacity on this route.

Both of these electronic exchanges had been previously provided (by Philips Communications Systems) as part of the Department's Main Line Electrification Project.

During the same week of February a Time Assigned Speech Interpolation (TASI) system was commissioned between the Brisbane and Rockhampton telephone exchanges, using the new cable and radio systems between Gladstone and Rockhampton.

The TASI system effectively doubles the number of simultaneous telephone calls on the Brisbane - Rockhampton route from 12 to 23 by dynamically utilising the pause and silent periods in normal conversations for use by other telephone traffic.

When the transfer of signalling telemetry and block circuits from the open wire route to optical fibre cable and copper cable respectively late in April the open wire pole route is being demolished prior to energisation of the 25kV 50Hz overhead traction supply system.

Bookshelf

'Directory of Australian Tourist Railways and Museums - 1986' published by the Light Railway Research Society of Australia, P.O. Box 21, Surrey Hills, Victoria 3127. 40pp. Price: $2.40 including postage.

A few days before a copy of this booklet was supplied to the publisher, the editor of a prestigious European magazine was visiting Melbourne and requested specific information on Australia's tourist railways.

The most recent data available was very much out of date and far from accurate.

This small publication would have provided all the information he asked for... and, in fact, a copy has now been posted to him in Germany.

It's not an elaborate booklet - but line illustrations have been used throughout; the text covers the major tourist railways and museums in all states.

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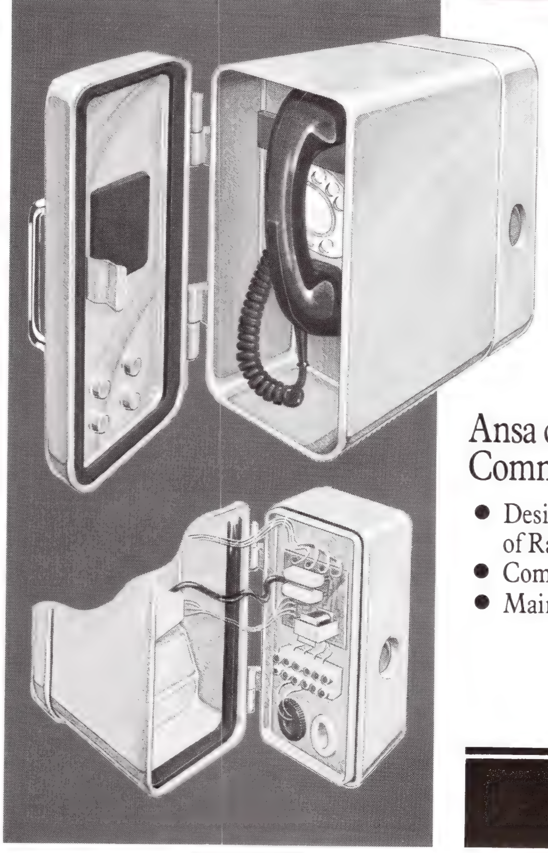

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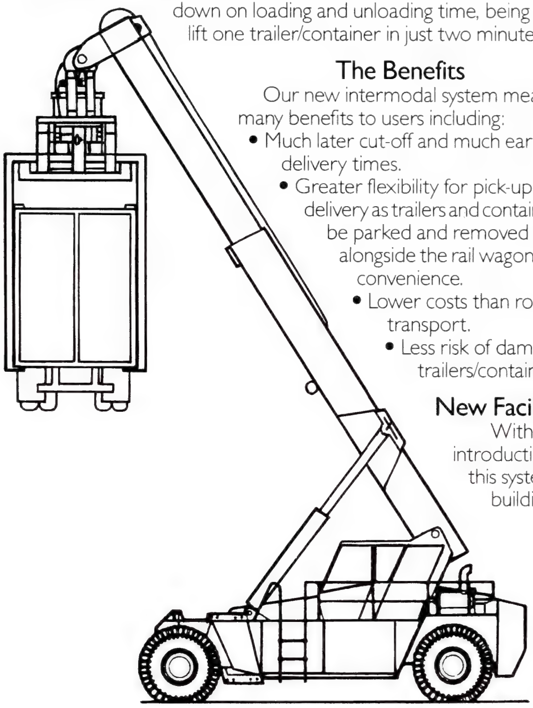

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With the introduction of this system, the building of new intermodal yards is in progress at Islington and Alice Springs. Our new designs facilitate unrestricted pick-up and placement of trailers by allowing for loading to take place on one side of the track and unloading on the other side.

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The Link to nationwide freight transport.

London's docklands rail-

By Chris Bushell

For years the dockland areas of London languished, robbed of their livelihood by rapid shifts in international shipping and trading patterns.

Here was a vast area of near derelict land, hectares of enclosed water, and some fine Victoria industrial buildings, all lying temptingly close to the City of London.

There was also a residual population that had become increasingly isolated as the once thriving docklands fell into decline.

But in the early 1980s things began to change. With the establishment of the London Docklands Development Corporation, the area's huge potential is at last being realised in the form of cheap land for new industries, new and refurbished housing, and development of leisure facilities.

Vital Factor: Good transport was seen as a vital factor in the rejuvenation of the area, both for industrial and residential use, and it was felt that only a fast rail link to the main London underground rail system would be sufficiently attractive.

Lengthy speculation on the form of such a link was resolved by the decision to go for an automated but otherwise conventional steel wheel/steel rail light rapid transit system.

A construction contract was placed in August 1984, and completion is scheduled for July 1987. A joint venture organisation formed by GEC Transportation Projects Ltd (1) and John Mowlem PLC is constructing the 12 km network, which takes the form of a Y-shaped route.

From Tower Hill in the west and Stratford in the north-east, the two prongs of the Y join at Poplar and run as a single route southwards through the area known as the Isle of Dogs, formed by a loop in the River Thames, to a terminus at Island Gardens, opposite Greenwich.

At Tower Hill, on the fringe of the City of London, the objective of a good connection with London Underground services has not been met entirely satisfactorily. By reason of the very high cost of a tunnel approach on what is otherwise to be a mainly elevated line, the docklands railway terminus - for the moment at least - will be located 400 m from Tower Hill underground station.

An improved connection at a later date is not ruled out, nor is the possibility of some form of moving link between the two stations, such as a walkway.

The docklands area was once served by an extensive rail network, both public and private, and some existing alignments are suitable for the new railway.

Most of the route will be on elevated structures, consisting of a mixture of new construction and refurbished existing viaducts.

From Tower Hill, the route parallels British Rail's Fenchurch Street suburban line, at first on new viaduct but between Shadwell and Stepney East actually taking over two of the four British Rail tracks.

Major Interchange. The British Rail alignment is also followed on the branch to Stratford, partly in a disused cutting and partly on a spare track parallel to existing lines.

At Stratford, a major interchange, the docklands platform will be adjacent to British Rail and London Underground Central Line tracks.

'Trains will be fully automated'

There will be connection here with another railway, the newly electrified North Woolwich line, which has been upgraded to serve the eastern docklands area.

Close to North Woolwich is the site of the short take-off and landing (STOL) airport recently approved for construction.

It will provide a major boost to the docklands development, and there are plans for an eastwards branch of the light railway to give direct access to the STOL port.

As is now common on urban public transport, the 16 stations will not be manned. Instead, they will be supervised by closed circuit television from a central control room.

Tickets will be sold from automatic machines, and, following tramway practice in mainland Europe, will need to be validated before the start of the journey.

Stations will be simple structures with 30 m platforms, which is just long enough to accommodate the two section articulated cars.

About a third of each platform length will be sheltered by canopy, while there will be lifts for ease of access by disabled people.

There is, as yet, no unmanned train operation in Britain. Although the Victoria Line of the London underground is fully automated and requires no driver for completely safe

'THE AREA'S HUGE POTENTIAL IS AT LA

k to invigorate East End

operation, a "controller" is always present in the front cab.

On the Docklands Light Railway the process will be taken a stage further.

There will be an operator on board, who will close the doors and start the train from each station, but he will be free to move around collecting tickets and assisting travellers generally.

He will be fully trained to cope with any emergency, and will be able to drive the train manually if the automatic equipment fails, but he will not ride in the front of the train, and in fact there will be no cab.

As on other automated systems, there will be full radio communication between the train operator and the control centre.

> ‘Operator is free to collect tickets’

Three Speed Codes. GEC-General Signal (2) is providing the automatic driving equipment, which is a development of that already in service on the unmanned Birmingham Airport people-mover system. There will be no conventional lineside signals. Instead, the train mounted countrol equipment will pick up speed signals from the track.

Full automatic train operation and protection equipment will be installed, with train detection by means of jointed, audio frequency reed track circuits giving three speed codes.

> ‘No conventional lineside signals’

Track mounted magnets will transmit signals to a microcomputer mounted on the train, which will translate powering, braking and stop commands to drive equipment.

At each station there will be special docking equipment to ensure that trains are correctly positioned at the short platforms before the doors can be opened.

Terminal platforms will have additional safety features to guard against over-runs.

Traction power supply will be at 750 V dc from a protected third rail. There will be just one sub-station to transform power from the national electricity grid.

Each train will consist of a two section articulated car 28 m long, with space for 88 seated passengers and up to 139 standing.

The train set will consist of two steel bodies mounted on three bogies, with the centre bogie unpowered and providing support for the articulation.

Each powered outer bogie will have a longitudinally mounted 150 kW traction motor, supplied with current by GEC Traction (3) gate turn-off thyristors.

Rheostatic braking will be fitted. The acceleration rate will be 1.3m/s² to a maximum speed of 70 km/h.

Standard Steel Sections. Construction work began in September 1984, although some preliminary site clearance started earlier.

The new structures are characterised by widespread use of standard steel sections and prefabricated concrete components.

A typical viaduct structure takes the form of a concrete deck 8030 mm wide supported on twin concrete pillars.

Ballastless track on these new structures will consist of 40 kg/m rail laid in resilient mountings integrated with the cast concrete deck.

Elsewhere, conventional ballasted track will be laid.

Apart from the 16 stations, there will be a depot for car maintenance at Poplar, and the sub-station and control centre buildings will be close by at North Quay.

When trains begin to run in July 1987, they will operate two services over the Y-shaped route, from Island Gardens to Tower Hill and from Island Gardens to Stratford.

It is planned to run trains at 7½ minute intervals over each route, giving a combined frequency of a train every 3¾ minutes from Island Gardens.

At the start, demand is thought unlikely to exceed 1500 passengers an hour, and this level of service can be handled by nine of the 11 cars that will be provided initially.

Should the extension go ahead, with its considerable traffic potential at the STOL port, then demand will rise substantially and a further 20 cars could be needed.

> ‘Speed signals picked up from track’

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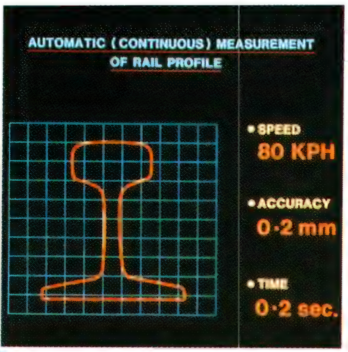

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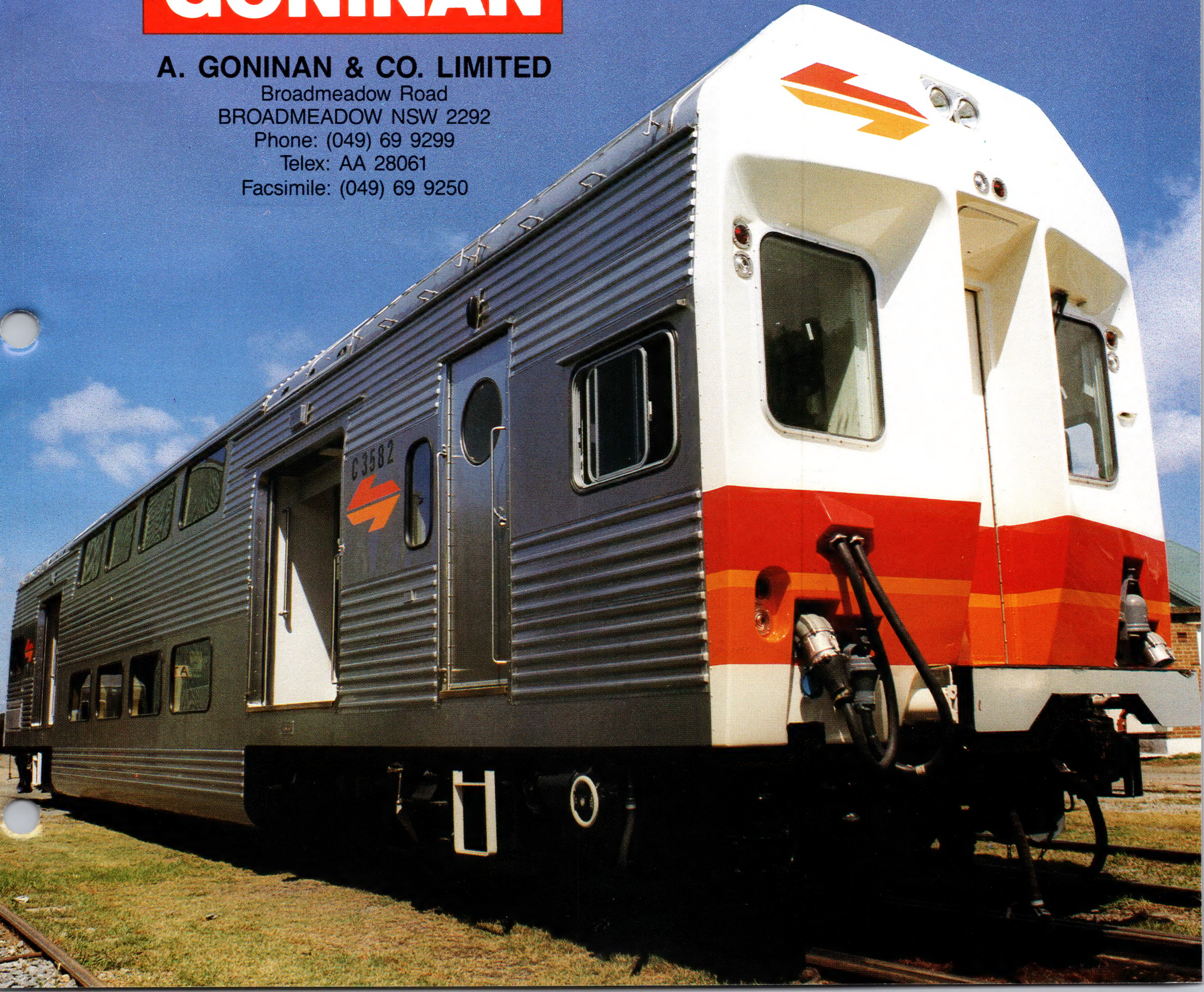


New Commissioner for Queensland Railways

On May 22nd Mr R. T. Sheehy was appointed Commissioner for Railways by the Queensland Government Executive Council. Mr Sheehy had been Acting Commissioner since the retirement of Mr D. V. Mendoza earlier this year. He becomes Queensland's 17th Commissioner for Railways.

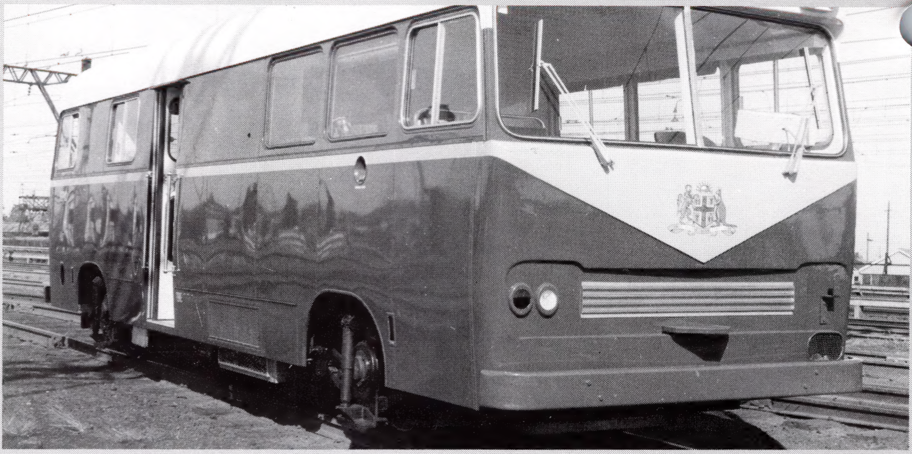
At the same time the following appointments were made: Deputy Commissioner and Secretary, Mr R. W. Dunning; Assistant Commissioner (Operations), Mr C. V. Walton; Assistant Commissioner (Commercial), Mr J. W. Linfoot; Assistant Commissioner (Maintenance & Workshops), Mr W. J. Adamson; Assistant Commissioner (Technical Services), Mr J. F. Jeffcoat; (Assistant Commissioner (Projects), Mr R. G. Reid.

Mr R. T. Sheehy

Rail grinder contract

A Strathpine firm Tamper Australia Pty Ltd has won a $1,588,819 contract to supply a rail-mounted rail grinding machine to Queensland Railways.

It's the first machine of its kind to be bought to Queensland Railways, and will extend the life of railway lines when used in conjunction with the Railways' rail planing machine.



Last pay 'Bus' off the tracks

The last State Rail Authority pay "bus" has been taken out of service - a victim of technology and changed banking habits.

For almost 50 years the four-wheeled pay trains, which looked more like buses than trains, delivered pay packets to workers along the State's 10,000 kms of track.

Each unit was crewed by a driver, guard and paymaster.

Instead of cash-in-the-hand, employees are now paid by cheque or directly into bank accounts as the pay bus passes into history.

The original fleet of six pay buses entered service in 1937, at a cost of 1,400 each.

They were replaced in 1968 by seven air-conditioned buses built by Comeng, Granville, for $37,000 each. Until April, one unit was based at Parkes, one at Newcastle and five at Sydney.

Royalty

In April 1970, one bus was pulled from the fleet for duties "by Appointment to H.R.H. Queen Elizabeth II" - for probably the shortest ever royal rail journey.

The bus carried the Queen the 600 metres from her yacht "Britannia" at the end of Coffs Harbour jetty to Coffs Harbour railway station.

Two new members for Rail Authority

Two new members with vast commercial and administrative experience have been appointed to the State Rail Authority of New South Wales.

They are Norm Oakes and Reg Watson, who began their three-year terms on March 1.

Their expertise will aid the Authority, whose membership was increased from seven to nine on January 1 by a legislative amendment to the Transport Authorities Act, N.S.W.

Both new members have considerable experience in railway administration.

Norm Oakes, A.O. B. Ec., a former head of the N.S.W. Treasury, was an inspector of railway accounts and has a close association with, and interest in, railway matters.

He enjoys squash and swimming, and is active in Sydney Rotary, Red Cross, Salvation Army and the Science Centre Foundation.

Reg Watson, A.O., C.M.G., recently returned from London after a three-year term as NSW Agent General.

He was chief of Rothmans for 10 year and has held several senior public administrative positions, including chairman of the N.S.W. Overseas Trade Authority (1977/82) and member of the N.S.W. Public Transport Commission (1972/75).

Both new members are married with adult children.

Coal movement records broken

Record coal tonnages were railed from central Queensland coal fields during the week ending March 8.

464,596 tonnes had been railed from Moura to Blackwater and 731,713 tonnes had been railed to the Mackay area, a total of 1,196,309 tonnes.

The previous record had been 1,194,448.9 tonnes, railed during the week ending November 9, 1984.

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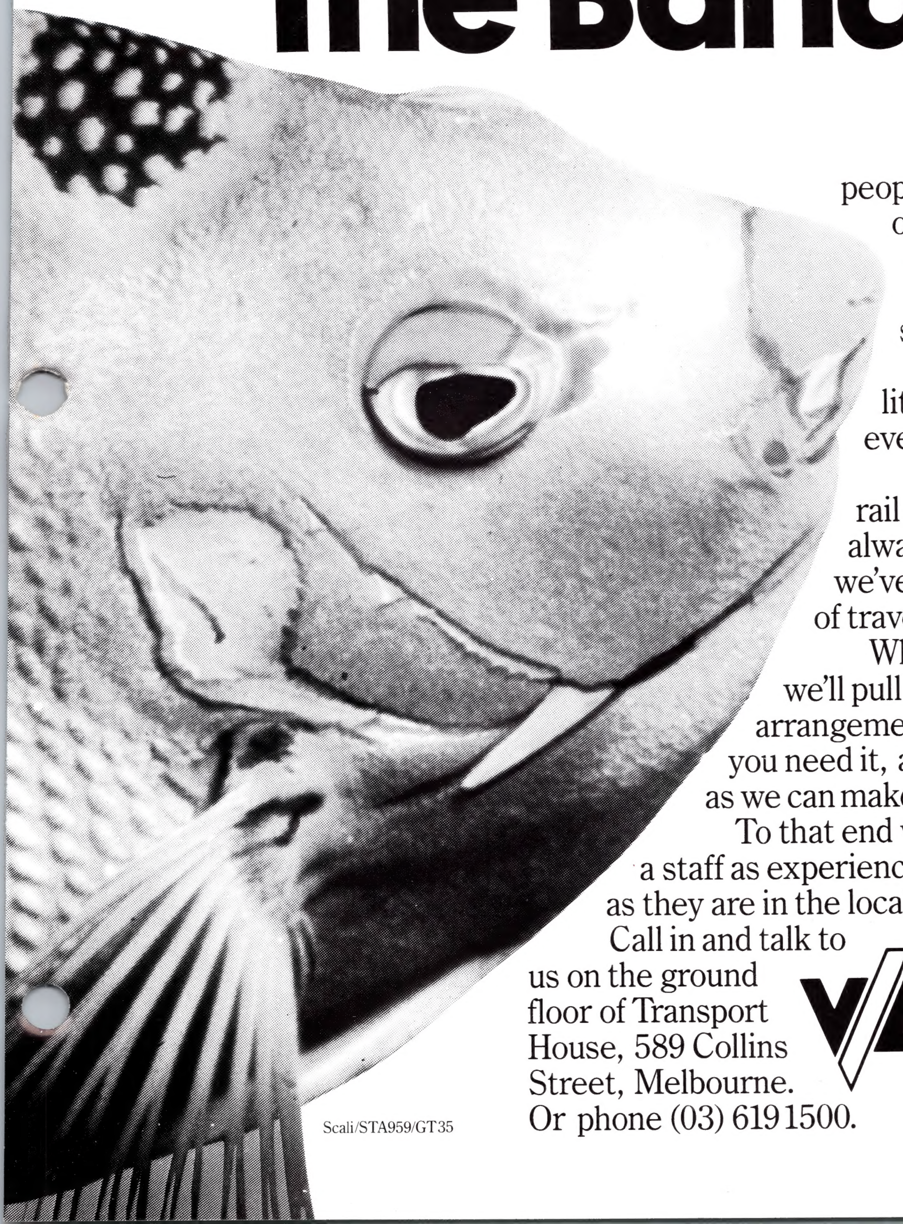

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